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ABSTRACT

The proceedings of the 1970 annual meeting of the Council of Graduate Schools in the United States covers a reassessment of the doctoral population with outlooks for the future by Michael J. Pelczar, Charles E. Falk, J. Wayne Reitz, T. L. Cairns, Robert Alberty, and Richard P. Adams; reassessment of the master's degree by Henry V. Bohm, Francis M. Boody, Jacob E. Cobb, and Arliss L. Roaden; a reassessment of the Ph.D. by Daniel Alpert, W. Donald Cooke, Michael J. Brennan, and David R. Deener. Additional presentations included in the report are on the Ph.D. surplus by Harold P. Hansen; doctoral programs in new and emerging institutions by Edwin L. Lively; the ACE report on rating of graduate programs by Trevor Colbourn, Eric Rodgers, Stephen E. Wiberley, and Francis M. Boody; the position of the graduate dean in times of an austerity budget by Rocco E. Porreco; faculty unionization by Henry V. Bohm; and the place of the dissertation in the training of graduate students by D.C. Spriestersbach. The role of the National Science Foundation in graduate education is discussed by Lloyd Humphreys; and a report of the Wingspread Conference on the Doctor of Arts Degree is offered by Alvin H. Proctor and Robert E. Wolverton. Workshops held at the meetings are reported including automation of records; nondegree and continuing education; rights and obligations of graduate assistants, fellows and trainees; graduate student organizations and representation; and costs of graduate education. (JMF)

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Proceedings of the Tenth Annual Meeting

COUNCIL OF GRADUATE SCHOOLS
IN THE UNITED STATES

Theme

REASSESSMENT

cgs

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
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Miami Beach, Florida
December 2–4, 1970
Hotel Fontainebleau

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First Plenary Session: The Doctoral Population

Wednesday, December 2, 1:30 p.m.

Presiding: Mina Rees, *Chairman, Council of Graduate Schools*
Moderator: Michael J. Pelczar, *University of Maryland*

Charles E. Falk, *National Science Foundation*
J. Wayne Reitz, *Department of Health, Education, and Welfare*
T. L. Cairns, *E. I. duPont deNemours & Co.*
Robert Alberty, *Massachusetts Institute of Technology*
Richard P. Adams, *Tulane University*

Mina Rees

CHAIRMAN'S ADDRESS

At this Tenth Annual Meeting of the Council of Graduate Schools, it seems to me appropriate that I address my opening remarks to a consideration of what the role of the graduate schools should be in the years immediately ahead, as we enter the second decade of the work of CGS. In doing this, I salute the large number of able men and women whose hard work and leadership have brought this organization to the place where it now provides an important forum for the discussion of our common problems.

There are two major questions to which I believe the Council should now address itself. The first concerns the whole range of practitioner's degrees and modifications of the Ph.D. to provide better preparation for practitioners. At its meeting last year, the Council took a small step toward meeting a piece of the problem when it blessed, in principle, the establishment of a practitioner's degree for teachers to be called the Doctor of Arts. This provides an alternative route for some potentially good teachers to prepare for careers in community colleges and in some liberal arts colleges. Are there other fields to which new Ph.D's will be turning for employment for which an alternative program might be appropriate? What of the practitioners whom society needs in increasing numbers in the delivery of health care, in the attack on environmental problems through multidisciplinary approaches, not only across disciplines and across divisions of the college of arts and science but also across schools of the university? What of the needs of business and industry?

The second question has to do with the way we, as one of the most expensive parts of the educational enterprise, organize ourselves to handle the diverse problems that confront us. As our graduates increasingly assume the role of practitioners, we shall need to provide greatly increased opportunities for them to keep in touch with advances in knowledge after they have left the university so that they may continue in effective practice. Many medical schools have regular academic divisions devoted to the post-graduate education of doctors. According to the Carnegie Commission, more are needed. Should our graduate schools take some organized steps to insure that this responsibility to our graduates who are in practice is competently handled? Are there some of our institutions that are particularly well equipped to undertake this assignment? Is there any way in which we can assure that every region of the country will be well served with universities or other kinds of institutions that see this kind of service as important?

In general, I would say, we need greater institutional specialization so that each of us undertakes to do those tasks we are best equipped to handle. Can we on our several campuses avoid duplicating, merely because they are there, the fashionable emphases in research found on the campuses of prestige institutions. At the City University of New York we have thus far managed in several of the sciences to have a special research focus on each of our five participating campuses and a truly cooperative program in the social sciences and the humanities. But the difficulties, both human and logistic, are formidable. Though I do not underestimate the difficulties, the problem deserves our attention. Can we achieve on a national or regional basis the specialization and cooperation that would be desirable from the point of view of optimum use of the resources of higher education as a whole? I shall say no more about this problem except to report that I have asked an *ad hoc* committee to look into a suggestion along these lines made by one of our members.

Let me give my attention now to the question of practitioner's programs. During its history of over one hundred years, graduate education has accepted the responsibility described many years ago by William Rainey Harper, first president of the University of Chicago, for "the adaption of [the university's] methods and training to the practical problems of the age in which we live." As Gus Arlt pointed out at the Woods Hole Conference on Graduate Education last year, this was a remarkable statement, coming from a man whose doctoral dissertation was "A Comparative Study of the Prepositions in Latin, Greek, Sanskrit, and Gothic." In some senses we are in Dr. Harper's position, for there are very few of us who are expert in providing solutions for the problems around us, nor are most of those on the faculties over which we preside. Thus, the needs of our society and of the generation of students who are entering both our undergraduate colleges and the graduate and professional schools of our universities require that we approach our task with a willingness to innovate and experiment, recognizing that this approach requires that we be clear about the goals we seek, that we use our best intelligence and effort to search for solutions, and that we be willing to evaluate our successes and failures honestly.

The sociology of higher education is changing explosively, and institutions of higher education are on the firing line of the social battle that envelops us. The college generation demands even more aggressively than the rest of us solutions to the problems of environmental pollution, population growth, and continuing poverty in the midst of plenty; rejects the technological domination of our affluent society; insists on immediate racial justice and real equality of educational opportunity after a hundred years of unredeemed promises. Since in many fields employment opportunities for new Ph.D.'s are in short supply, our students will be seeking other outlets for their talents at precisely the time when many social problems demand not only political and community action but also careful study and trained intelligence.

To what extent should we develop practitioner's degrees in addition to the D.A.? Can much of the education for the D.A. perhaps serve a broader purpose than the training of college teachers? If not, can we find a broad base of graduate work that would be appropriate for the training of practitioners in a variety of fields? I consider this question particularly important because, as society shifts its priorities, our graduates will need versatility in changing fields. Needless to say, this question can be important also for sound education as well as for the welfare of the universities in this period of financial crisis. In my own university we are exploring the possibility that a year of specially designed graduate work involving all the social sciences addressed to critical aspects of the city's problems might serve as a base for work in public administration, the administration of hospitals, and other aspects of the delivery of health care, the administration of social welfare, and possibly educational administration and the administration of criminal justice.

Before we plan further shifts in the focus of our undertakings, perhaps we should review our present condition. What are the functions that the graduate and professional schools are best equipped to undertake? What have been our successes thus far? What have been our failures? From the limited undertakings of early American colleges, primarily to train clerics, through the powerful and singularly American successes that flowed from the Morrill Act of 1862, our institutions have developed post-collegiate education to serve the needs of an increasingly complex and sophisticated society. The Ph.D. has been the most versatile degree. It has produced and continues to produce a multitude of excellent teachers as well as some of the world's most distinguished scholars and creative scientists. In America, in contrast with the practice in many European countries, we have required more or less extensive course work at the graduate level that has insured some measure of breadth within the field of specialization and some understanding of the conceptual framework of the field. In the natural sciences, where over half of the Ph.D.'s find their first employment primarily in research (many in industry), our graduates have been partly responsible for the technical productivity of industry. Yet in industry, as in the universities, there has been complaint about the attitude of the new Ph.D. I believe the basic problem arises from the attitude of university scientists (as well as university specialists in other disciplines) that it is somehow demeaning to work on other people's problems. This attitude may well have grown up because the questions other people ask are often too difficult to solve! But I would suggest that at least one change that we might consider would be the introduction of additional practitioner's doctorates in scientific fields in which the research of students focuses on more cooperative or team projects within the university as preparation for the cooperative work on assigned problem which they are apt to find in industry or government.

Both success and failure have accompanied the entry of science Ph.D.'s into industry and government. The same is true of Ph.D.'s who have entered teaching. There have been multitudes of Ph.D.'s who have accepted appointments at undergraduate colleges, and many of them have become distinguished teachers. It is true that we have often encouraged students to undertake very limited and specialized research; but I believe that the basic weakness of the Ph.D., as preparation for some of the tasks undertaken by many of those who hold it, is its limitation, in many cases, to course work within a single department, and, after the first year, to very narrowly specialized study. We frequently fail to provide scope and insight into our own subject because we fail to expect graduate work to be carried on in cognate fields that will illuminate the student's specialty. In Ph.D. programs, as well as in D.A. programs, we need to ask, for example, whether there are specially designed graduate courses in psychology that should be expected of students in literature, history, and political science;

whether an American historian can really understand and teach his field without a sophisticated understanding of economical and political forces.

But however successful its design, any program can succeed only with students who have some gifts for its practice and objectives and some devotion to its purposes. In the case of the D.A., there has been widespread interest. A number of institutions have intitiated programs, and some degrees have actually been awarded, the largest number by Carnegie-Mellon University, a pioneer in the program. Carnegie-Mellon has thus far granted fifteen Doctor of Arts degrees. To quote Dr. H. Guyford Stever, president of that institution, "The program is the university's considered answer to alternative graduate degree programs for training teachers and future leaders in secondary schools, junior colleges, and possibly some liberal arts colleges." A conference on the D.A. was held last October, which will be reported on at the final session of this meeting. I will comment now merely on my feeling that some of the programs with whose details I am familiar seem to fail disturbingly to keep before them the goals set for the degree. The guidelines of the Council of Graduate Schools emphasized the need for breadth of training and the requirement that the educational level of the D.A. should be the same as that of the Ph.D. Providing a year of college-teaching internship and reducing the quality and depth of education is not what we seek.

As we explore alternative paths for the education of the teachers who will lead our colleges into the decades ahead, let us remember that the colleges will be serving a student population much more broadly based intellectually and socially than the students who attended colleges a decade ago, students determined to address their energies to many of society's most stubborn problems and students who are sure that the cultivation of their affective potential during the college years is at least as important as the cultivation of their intellectual potential. The preparation of teachers equipped to deal with the intellectual, social, and human demands that the colleges will make upon their faculties in the years immediately ahead is no small task. A Doctor of Arts degree that provides the student only with broadly based survey courses in his field will not, I believe, give him the intellectual resources to cope with the difficult problems he must face as a member of a college faculty. Our traditional stance has been that the doctorate will give a student a mastery of some part of a field of knowledge and a grasp of his sub-specialty that brings him to the frontiers of research; and, if the degree he seeks is a Ph.D., that he will be expected to demonstrate ability to push some frontier a little further. If the degree is a practitioner's degree, for example, an M.D. or a J.D., his training is likely to draw on more than one discipline; and, through clinical experience or internship, either before the degree is earned, or sometimes after, he is expected to demonstrate that he is able to put his learning into practice. By taking either of these routes, we expect that a person who has earned a doctorate will have learned, in his field, how to question the results reported by others, how to judge evidence, when to assent, when to seek further evidence, when to reject conclusions based on faulty assumptions, faulty evidence, or faulty reasoning. It is essential, as we increase our commitment to practitioners' degrees, including the D.A., that this training in healthy skepticism not be lost. The D.A. has the merit of providing an alternative path for potentially good college teachers that does not emphasize the kind of research that they find unattractive and unrewarding. Similarly, those who seek a career in public service in one of many fields should be able to take a route through master's and through doctor's degrees other than narrowly specialized research degrees that will enable them to enter the field at a level of high competence. I believe the time has come for the Council of Graduate Schools to give its attention to this problem.

I hope that as we do this we will not decide that every one needs an advanced degree to function effectively in society. But for those who need what our universities can offer, I hope we can find some way to encourage each of our member institutions to define for itself the role that it is best able to play so that the diversity of the problems we attack can be handled with the resources that we may hope to have at our command.

We proceed now to the afternoon program. The Executive Committee of the Council has decided that the Committee on Policies, Plans, and Resolutions, which concerns itself with the questions that the members of this body have identified as of extreme importance, should conduct a session at each of the Annual Meetings. This afternoon's session, then, is under the auspices of this committee, and I now present Dr. Michael J. Pelczar, Vice-President for Graduate Studies and Research of the University of Maryland, who is chairman of the committee. Dr. Pelczar.

Michael J. Pelczar

THE DOCTORAL POPULATION

During the course of the year, the CPPR Committee held two meetings, and among other business discussed was the program for this plenary session. The topic that seemed to surface more frequently than any others was the matter of new doctorates and job opportunities, or, as the press refers to it, "the Ph.D. surplus."

Charles E. Falk

PROJECTIONS OF THE DOCTORATE POPULATION

I would like to point out to you that the title of my talk represents from one point of view an overstatement and from another point of view an understatement. It is essentially an overstatement in that it implies that I will talk about all doctorates. However, because of my own interest and activities at the National Science Foundation, I will limit my remarks to doctorates in the fields of science and engineering. These I will treat in a comprehensive way by covering the life, physical, and social sciences as well as mathematics and engineering. The title is an understatement since it implies that I will discuss only future doctorate populations. However, I will cover also the current situation. Thus, I will discuss with you the total question of the supply-utilization relationship, present and future, for doctorates in science, and I will use the term "science" in a generic sense to cover all science and engineering.

The question of supply and demand has become relatively more urgent during the last few years and is now becoming more critical almost by the week. You are, of course, very much aware of this; and the fact that you have a session on this topic here today is a direct indication of your concern.

The issue has urgency for different groups for different reasons. The new Ph.D. or the graduate student is considerably worried about his prospective employment opportunities. Frequently this is not a question of whether there will be an employment opportunity, but what type of employment opportunities will exist and whether they will match the new Ph.D.'s aspiration? Going back even further in the educational process, the potential science major and science bachelor worries about this aspect because he will have to make a decision whether he should continue to pursue an education in science leading to a basic or advanced degree. The academic institutions and the various departments have great concern about the expected supply-utilization relationship because they need this information for any kind of meaningful planning dealing with the quality and quantity of their future graduate programs. And, finally, all of us, and especially those of us in the government, worry about whether there will be an adequate supply of highly trained personnel to really meet the needs of our society.

So from every point of view, this issue is an urgent one. Unfortunately, it is somewhat more difficult than usual to make projections at this time because manpower trends are clearly in a transition phase. In making these types of projections, a number of

We are well aware of the fact that this audience needs no review of the kind of publicity that the public is being exposed to in terms of the output of doctorates and the positions that may or may not be available to them. But in order to set the stage for some of the commentary that will follow, I thought it might be good to read a few headlines, bearing in mind that this is what the public is exposed to and what has a great deal to do with molding their opinion.

For example, the New York Times recently printed the following—"The Ph.D. has become a problem degree. For the first time in American educational and professional history there is an oversupply of Ph.D.'s. Demands are growing that universities turn their attention from quantity to the need for a new kind of quality in doctorate production." The Washington Post recently carried this lead to an article: "Ph.D. glut creates a jobless U.S. elite." The Johns Hopkins Magazine carried an article by Irving Phillips and George E. Oldham saying: "Ph.D.'s for what?"

Despite these rather categorical pronouncements, few if any of us would concede that we have an oversupply of knowledge and talent, talent that is so urgently required to engage in the increasing complexity of problems confronting global habitation.

What is the real situation? What are the facts? Is there overproduction of doctoral students, or is there an underutilization in the sense that we are experiencing a mismatch between occupational opportunities and available and needed talent.

Dr. Norman Borlaug, the 1970 recipient of the Nobel Peace Prize, lamented the lack of dedicated scientists willing to get away from laboratory research and white coats to come to the fields and work with their hands. To quote Dr. Borlaug, "We can't go chasing academic butterflies if we want to give people more bread." Along similar lines I heard Senator Hubert Humphrey say some time ago that some of the sociologists had better get out of the library and visit the inner city to find out what is going on. Are we providing too narrow a range of options in education and training for the doctoral candidates in our programs?

To address ourselves in an objective fashion to this question and other aspects of this major issue, we have been successful in arranging an excellent panel to participate in this discussion, which we judge to be one of the most important that confronts higher education, particularly graduate education at the doctorate level. The question of whether we do have a Ph.D. surplus is really central to many, if not all, of the deliberations that confront graduate education today.

factors have to be taken into consideration. I believe it might be worthwhile to mention a few of these because they will indicate to you why projections have to be dynamic. They have to be repeated at fairly short intervals because the situation is changing so rapidly.

Doctorate Production

If one considers the production of doctorates, there are what one could call the usual factors, the factors that always have to be taken into consideration. In the first place, there is the demographic factor. How large is the age group who could potentially go to graduate school and obtain Ph.D. degrees? A second consideration is the fraction of this age group who will not only finish college but then will advance to graduate school and actually obtain the doctorate. As you know, that fraction has steadily increased over the last couple of decades.

It used to be that these two factors were fairly well known. The demographic one certainly is clear-cut because people who are going to get doctorates, at least during the next ten years, have already been born and are already in the pipeline of our school system. In the past, the rates of those moving towards advanced degrees have shown some very steady trends. But that situation is very different now and has been different for the last few years. Furthermore, some other factors have crept in which can and will become increasingly important and are much more difficult to predict.

We have seen a growing distrust of science by students and by our society because they have become increasingly aware of some of the problems that are associated with technology. These problems, critical though they may be, have received disproportionate attention in that people are too easily forgetting the vast benefits that have evolved from science and technology and are only looking at the problematic aspects. The net result has been that such antipathy to science has affected students' educational and career choices.

Also, during the last couple of years, a considerable amount of publicity has been given to the alleged lack of employment opportunities for scientists and engineers. Dean Pelczar has already mentioned this. I believe that these accounts have been somewhat exaggerated since we do not have very much statistical evidence on a national level that a major unemployment problem has existed—at least, not up to now. As was mentioned before, the real problem seems to be a mismatch between aspirations of new Ph.D.'s and available employment opportunities.

For example, the latest National Register of Scientists was completed by NSF last spring, and some of the data have now been compiled. I should caution that this Register does not include engineers, and that we achieve about an 85 percent response rate from Ph.D.'s. The unemployment rate among those that responded was of the order of 1 percent in the doctorate population. Similar results were produced by a number of other surveys. So the relative number of unemployed Ph.D.'s seems to be not very large.

However, there is another aspect of the problem, that of underemployment, namely, whether there are significant numbers of science Ph.D.'s who are not adequately using their graduate training. The answer to this question is much more difficult to obtain. Some relevant information was produced last year by a National Academy of Science survey, which will be repeated this year. This survey queried departmental chairmen as to what extent their new Ph.D.'s had to accept jobs that did not adequately use their graduate training again. The percentage for 1969-70 Ph.D.'s was small, only about 1 percent.

A third factor is, of course, one which you are very much aware of, namely, that quite a few graduate departments are reducing the number of first-year graduate students that they are willing to accept. This action is taken for a variety of reasons. In some cases faculties worry about the employment opportunities of the Ph.D.'s they might be producing. In other cases, it is simply a matter of finances. Graduate education is the most expensive part of higher education, and fiscal stringencies at a university might require that the graduate program be somewhat reduced. Finally, and this to me is still somewhat surprising, some departments have reduced their first-year enrollment because they do not see their way clear to provide stipends to their graduate students during their whole graduate-school career. It seems to me that this is an artificial limitation. If a student is qualified and willing to pay his own way, why bar him from coming to a university?

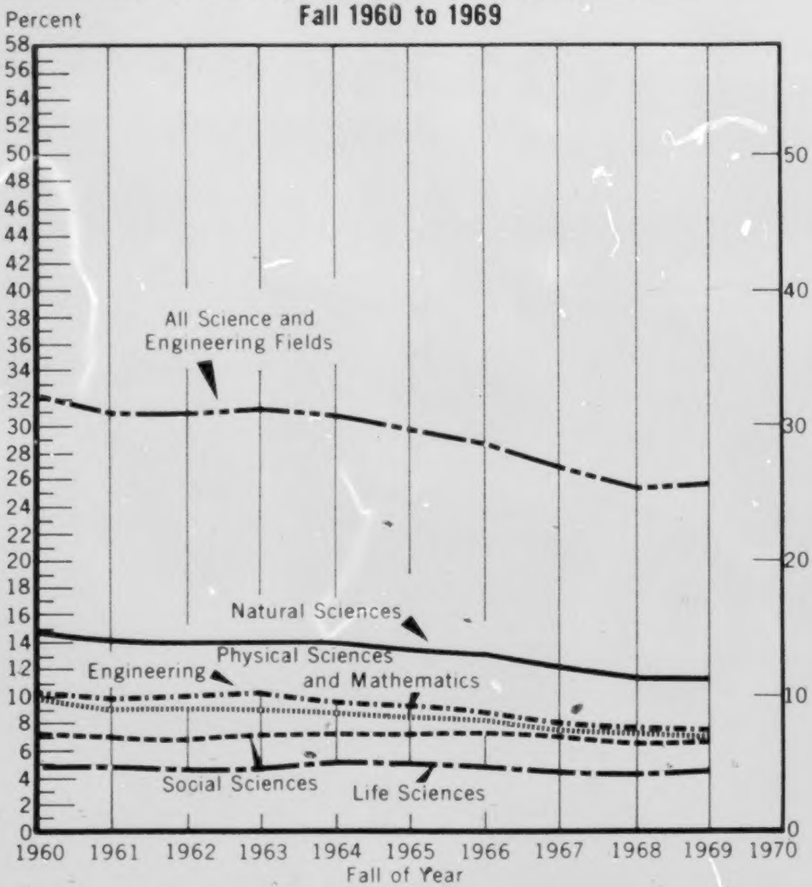
Now, all of these factors, unfortunately or fortunately, depending upon one's point of view, have a tendency to push the production of Ph.D.'s downward; and this is a phenomenon that is not completely new, as I can illustrate with a couple of charts.

Chart 1 (p. 17) shows first-year enrollment for advanced degrees in sciences and engineering as a percentage of first-year enrollments in all fields. As can be seen, starting in about 1964, that percentage has been decreasing; and while in the last year the rate of decrease has slowed down, it is not clear at all that this decline will not continue. So this phenomenon, for one reason or another, of having relatively fewer students pick science as a subject of their graduate study has been experienced for the last four or five years. Of course, the absolute number has continued to increase.

Chart 2 (p. 18) shows the annual number of baccalaureate degrees in selected fields of science. While the previous graph represented relative

CHART 1

First-Year Enrollment for Advanced Degrees Science and Engineering as a Percent of All Fields Fall 1960 to 1969

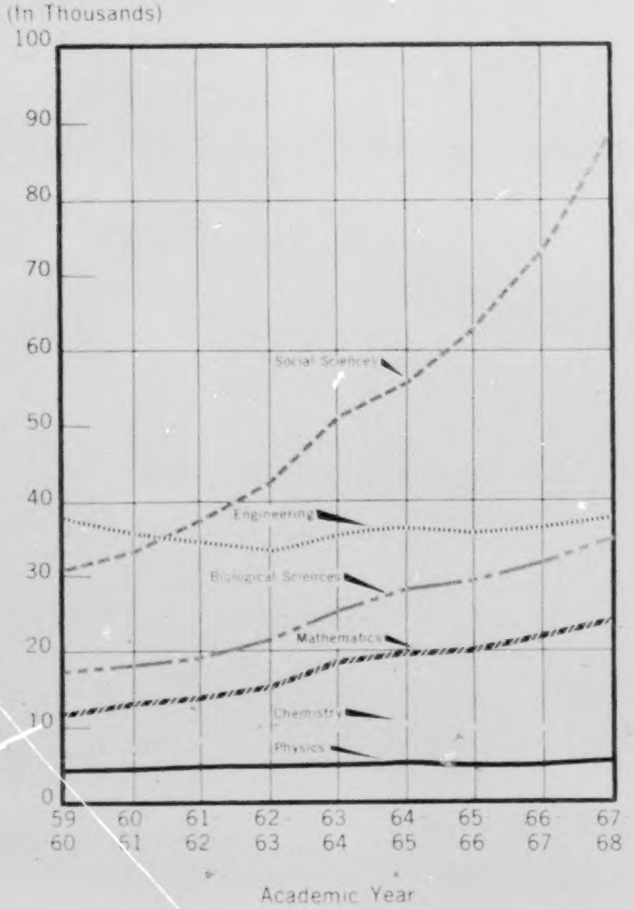


Source: U.S. Office of Education

data, these are absolute numbers. As can be seen, even in absolute terms in some fields, especially the physical sciences, there has been a flattening of the annual number of baccalureate degrees that are being awarded; while in other sciences, such as social sciences, this number has increased dramatically.

CHART 2

Bachelor's Degrees In Selected Science Fields, 1959-60 To 1967-68



These, then, are some of the factors that have to be taken into consideration in projecting the future availability of Ph.D.'s. I want to emphasize that, of course, what we see today in terms of baccalaureates and first-year graduate enrollments will only have an effect on doctorate production four to six years from now.

Doctorate Utilization

As for utilization of Ph.D.'s, we have several phenomena that have really been the basic cause for some of the difficulties experienced during the last two years. In the first place, about 30 percent of the Ph.D.'s in science are involved in non-academic research and development, and the nature and magnitude of this R and D effort has been changing for the following reasons. Three-fifths of this type of R and D funding comes from the federal government; the priorities of the federal government for R and D are changing; furthermore, the absolute amount of R and D dollars obligated by the government has been decreasing since 1966. In 1967 it amounted to $16.5 billion, and in 1969 it was down to $15.6 billion. This might not seem like a very big decrease. It is only about 6.0 percent, but if one translates it in terms of real dollars, then this decrease amounts to 14 percent over a two-year period. Certainly this trend has and, if it continues, will affect the number of Ph.D.'s who can be active in research and development activities.

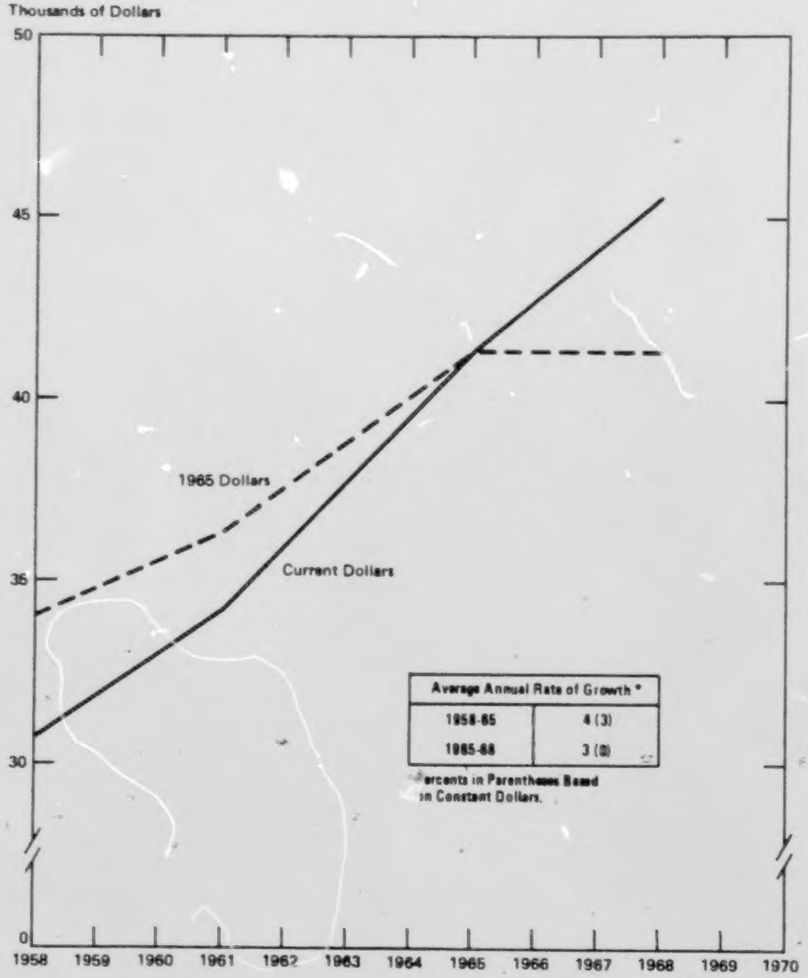
Now, the non-federal component of our national R and D funding—and here I am talking primarily about industrial sources of funds—has continued to increase despite this drop-off in government R and D obligations. But there is a question as to whether it will continue to do so. The state of the economy has changed during the last year; it has not been as rosy as it was before. Under these circumstances, R and D programs are easy prey to budget-cutting because generally their products produce long-range results and thus do not seem so urgent today. Furthermore, at least on the basis of anecdotal information, I am under the impression that many industrial firms have maintained the level of their R and D funding primarily to keep their research teams together, with the hope that the downward trend of government funding would reverse itself and that they would then be in a good position to apply for governmental funds. This stockpiling may also cease.

So, in this non-academic R and D component of utilization, we are in a period where there have been downward trends; and one of the big items of uncertainty is how long the downward trend will continue.

There is one factor that works opposite to the trend just described, namely, the number of R and D dollars required per R and D scientist. Chart 3 (p. 20) gives you an idea of what has happened in recent times. It spans the period from 1958 to 1968. The graph depicts the actual cost per R and D scientist, not per R and D doctorate; and as can be seen, it has increased steadily. However, the interesting fact is that if one considers this in terms of 1965 dollars, that is, taking inflation into

CHART 3

Cost Per R & D Professional



Average Annual Rate of Growth *	
1958-65	4 (3)
1965-68	3 (0)

*Percents in Parentheses Based on Constant Dollars.

Source: National Science Foundation

consideration, the cost per scientist has remained pretty level since 1965, after an almost continuous rise during the previous decade.

It is not that difficult to deduce the reason for this. When things get tight, most institutions try to preserve their manpower and take their budget cuts in non-human categories: equipment, travel, publication cost, supplies and material. This has had the effect of leveling the constant dollar cost per R and D scientist. Now, if this continues into the future, then one would expect a considerably larger number of science Ph.D.'s involved in R and D than if this curve would resume its rise. I must admit that I do not believe that this flattening can go on forever. One can only reduce cost items like travel and equipment for so long, and then in order to have any type of effective R and D program one has to start increasing these budget categories again. Thus, my guess is that this curve will start to climb again, but certainly not at the rate experienced during the period before it flattened out.

Another component of Ph.D. utilization is their employment in academia. Here, the utilization is directly related to the magnitude of future enrollments. If these enrollments continue to increase, then the number of Ph.D.'s employed by universities will also increase. Thus, the principal question relates to the magnitude of this increase over the next ten years. Expecially important here are some of the factors that I mentioned earlier that have a tendency to depress enrollment. These could reduce estimates of future utilization of scientists in universities below levels projected two years ago. The academic employment aspect is especially significant if one considers the sectoral distribution of Ph.D. scientists (Chart 4, p. 22) and realizes that 60 percent were employed in 1968 by universities and colleges.

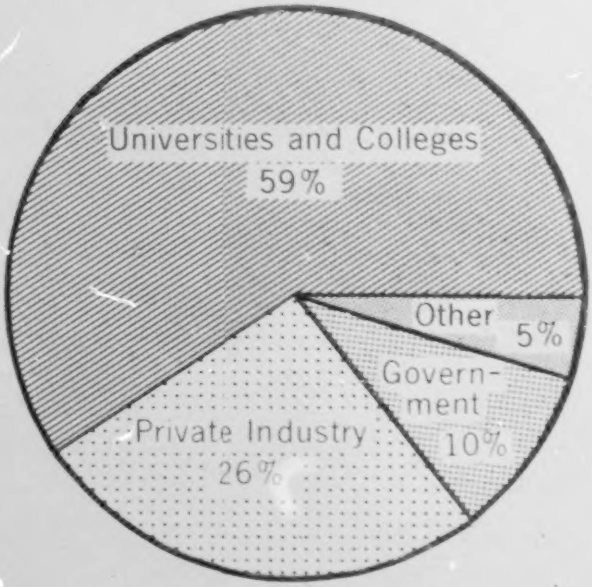
Projections

Now, let me concentrate on actual projections. To make projections is a precarious business under the best of circumstances, and considering the present uncertainties one might consider it a hopeless task. Nevertheless, they are needed more than ever at this time, and if developed on the basis of different assumptions, they can be quite useful to those who have to make long-range plans depending on prospective supply-utilization patterns. As long as the assumptions are clearly stated, users can select projections based on those assumptions that, in their judgment, are most likely to occur. However, as I indicated before, these projections have to be revised frequently in light of changing trends.

About eighteen months ago the National Science Foundation did develop a set of projections of what the situation might be like in 1980, and this was reported in NSF Publication 69—37. However, during the last six months we have looked at these projections again in view of the

CHART 4

1968 Utilization of Ph.D Scientists and Engineers, by Sector



Source: National Science Foundation, Planning Organization, Jan. 1970

changing circumstances. We have revised some of our assumptions and have also used, at least in one area, a somewhat different methodology. These new projections were not only produced for the total science and engineering doctorate group but also for doctorates in specific areas of science.

What are some of the changes that we felt had to be made since we produced our original projections two years ago? With respect to supply, two years ago we used enrollment projections that were developed by the Center for Educational Statistics of the Office of Education. However, now we feel that these might be somewhat on the high side because they are based on regression equations covering the last ten-year period. Thus, in our opinion, they do not place enough emphasis on what has been happening in recent years. Consequently, we developed our own model; and while I do not want to bore you with too much methodology, I want to outline some of the major features of this model.

We essentially established a set of ratios and the growth rates of those ratios: the ratio of bachelors in science and engineering in a particular year to total bachelors; the ratio of first-year graduate enrollment in science and engineering to bachelors of science and engineering in the previous year; the ratio of total science and engineering graduate enrollment to first-year enrollment in the previous year; and finally the ratio of Ph.D.'s to total enrollment three years before. In each case we developed historic growth rates for these ratios, but we only used data covering the period of the last six years. Since we felt that even this procedure would produce too optimistic a picture, we placed disproportionate weighting factors on actual data of the last three years.

The supply projections produced by use of this model indicate an annual doctorate production by 1980 about 16 percent smaller than what we estimated it to be two years ago. However, this still means that the doctorate production in science and engineering would increase by about 63 percent over what it is now.

The change in the projected 1980 graduate enrollment for science and engineering was more pronounced. As we see it now, it would be about 29 percent smaller than what we had assumed it to be two years ago. This is due directly to some of the factors illustrated in the earlier graphs (Charts 1 and 2), namely, that the enrollments and baccalureates on a relative scale have been decreasing. Consequently, we now project gradual enrollments for science and engineering to increase also by about 43 percent during the next decade, but this should be compared to 86 percent over an eleven-year period which was projected at the earlier date.

With respect to academic utilization, we considered this again from the point of view of a graduate faculty, faculty in four-year institutions and faculty in two-year institutions. Since our new graduate-enrollment projections are smaller than they were previously, the projected number of Ph.D.'s employed by institutions of higher education is also somewhat smaller. As for undergraduate enrollment projections, we still used the same O.E. projections that we used two years ago.

Of course, this time we had the additional task of projecting future utilization by field of science. In the academic sector we used enrollments as a basis. For graduate faculty this was simple because we could use the enrollment projections developed for each field of science. For undergraduate faculty we saw no better way than to assume that the distribution of faculty by area of science in 1980 would be about the same as it is now.

Thus, it is clear that during the next ten years new Ph.D.'s will be required by academic institutions for two reasons: there will be attrition from the present faculty due to death and retirement, and institutions will continue to grow. Now, instead of using the same proportion of Ph.D. faculty to total faculty that is in existence now, we assumed specifically that these new university appointments would consist of a relatively larger number of Ph.D.'s. We assumed that 95 percent of the newly appointed graduate faculty would be Ph.D.'s as compared roughly to 85 percent on present faculties. With respect to four-year colleges' faculties at the present time, roughly 44 percent have doctorates. We assumed that as far as new faculty was concerned, 75 percent would be Ph.D.'s, because Ph.D.'s would be more readily available. Finally, with respect to two-year college faculty, where the ratio of Ph.D.'s to total faculty now is only about 8 percent, we assumed that among new appointments the ratio would be 40 percent.

As for the non-academic sectors of employment, we now assume that national R and D funding from all sources will be between 2.7–3.0 percent of GNP by 1980. This range was selected because in 1967 the ratio of U.S. R and D expenditures to GNP was 3 percent and has now declined an estimated 2.7 percent. We do not at this point in time expect a further decline in this ratio. Now this, of course, does not mean that the level of R and D funding will be decreasing, because GNP is expected to continue to increase. For the 1980 GNP we used the current estimates made by the Bureau of Labor Statistics and other groups. All of them still assume an increase over this period equivalent to an annual increase of about 4 percent. We then split the projected R and D funds among the various sectors (industry, government, etc.) according to relationships that have been observed during the last five years. We projected the 1980 cost per non-academic R and D scientist, taking again some of the past trends into consideration and then, using ratios of R and D doctorates to total R and D scientists, came up with a total number of non-academic R and D doctorates for 1980.

Following this, we had the problem of apportioning these non-academic R and D doctorates among the various areas of science. Here we utilized a study that has recently been published by the Bureau of Labor Statistics on "College-Educated Workers, 1968-80," which projects utilization of all scientists and engineers by field of science by 1980. Now these BLS projections are for all scientists and engineers by field of science but not according to degree or type of activity. So, again, we had to develop ratios of total R and D scientists to total scientists, Ph.D. R and D scientists to total R and D scientists, etc., and analyze some of the rates of change of these ratios that had been experienced over the last few years. On this basis we then developed the non-academic R and D doctorate projections by field of science for 1980.

This may sound somewhat involved—and it is—but it is the only way to utilize some of the existing studies and some of the recent trends to project what the doctorate situation might be like ten years from now.

With respect to newly employed, non-academic R and D Ph.D.'s, we used two assumptions to obtain a range of possibilities. In one case, we assumed that that ratio of R and D Ph.D.'s/total R and D scientists for the new entrants would increase by 10 percent over that in existence in 1969; in the other we increased this ratio by 20 percent. These assumptions on relatively higher Ph.D. hiring rates are based on present indications that the next decade will not be one of acute shortages of Ph.D.'s and that, therefore, the non-academic sector would hire relatively more Ph.D.'s. But, as you may notice, our increase in the Ph.D/non-Ph.D ratios for the incremental number of non-academic R and D Ph.D.'s are not nearly as large as those assumed for the academic sector.

Finally, just as we did the last time, we had to calculate the probable number of Ph.D.'s who are neither involved in R and D or academic activities. These we classify as "others." There is a surprising number of these, and their relative number has been increasing even during the 1960 to 1968 period when we did experience doctorate shortages.

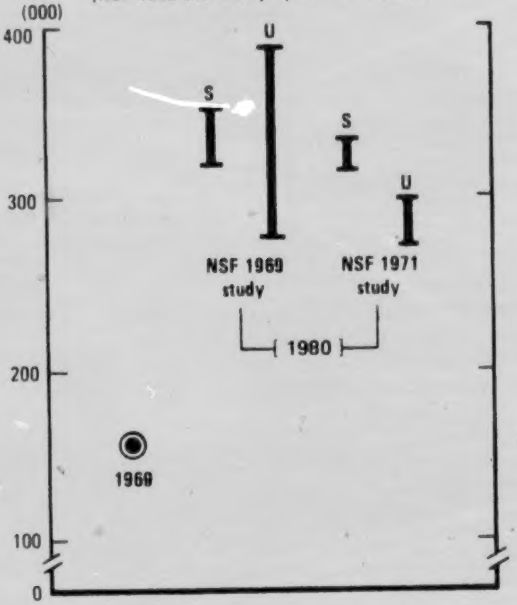
We have information from the National Register of Scientists on these people. From these data, we were able to develop past growth rates. For projection purposes, we did increase these growth rates by about 25 percent, again on the assumption that as the Ph.D. market became somewhat softer, more people would enter into these types of activities, which cover post-developmental industrial work, the type of practitioner activity which Dr. Rees discussed before, technical administration, etc.

Well, when we got all through with these computations, what did emerge as the likely 1980 situation? Chart 5 (p. 26) makes a comparison of our last projection for the total number of doctorates and the one which we developed now. The left part of the chart shows the present situation, namely, that we have now of the order of 158,000 Ph.D.'s, most of them being employed. The right-hand side of the chart shows our forecasts for 1980. The set of bar graphs (marked 1969) represents our previous estimates of supply and utilization. At that time the 1980 supply range seemed to fall smack in the middle of the probable utilization range. The second set of bar graphs at the extreme right represents our revised projections and, as is evident, the situation has

CHART 5

Supply and utilization of doctoral scientists and engineers, 1969 and 1980.

[NSF 1969 and 1971 projections compared]



Source: National Science Foundation

changed. The projected supply range does lie somewhat above the projected utilization range. Thus, the main difference between our last projections and the present ones is that now we are somewhat less confident about the probable balance than we were two years ago. However, there are recent indications that graduate enrollments in science have dropped considerably in 1970.

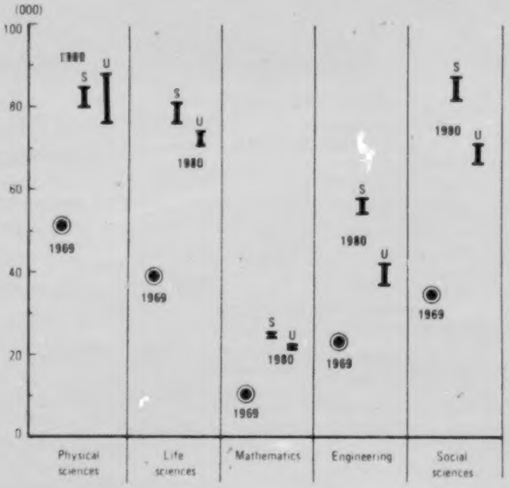
Now, let us consider the projections within the various areas of science: the physical sciences; the life sciences; mathematics; engineering; and the social sciences (Chart 6, p. 27). Let me mention first what one might call the extremes. In the case of the physical sciences, these projections seem to indicate that there might be a slight shortage; however, the supply and utilization ranges still overlap. In the case of engineering, on the other hand, there are indications of a possible real problem, because the likely supply range exceeds considerably the utilization range. This is the case primarily because we are already producing annually the equivalent of about 15 percent of the total number of engineering doctorates. Thus, this is one field where the supply-demand situation will require very careful attention.

In the other two areas, life sciences and mathematics, supply and demand appear likely to be slightly out of equilibrium by 1980. There are indications of some real possible excess supply in the social sciences. Again, I want to caution that, with the exception of engineering and the social sciences, I do not believe this to be very meaningful within the framework of the inherent uncertainties. However, within the physical and life sciences, and to a lesser degree in mathematics, I would say a problem does not seem likely by 1980.

A word of warning is in order regarding the life and social sciences. A considerable fraction of the Ph.D.'s in these fields are employed by universities and colleges. However, by the end of the next decade, the enrollment in universities is expected to drop for demographic reasons. As many of you know, our past birth rates will make the college-age population start to decrease by about 1978-79, and graduate enrollments will start to feel this effect in the early eighties. Furthermore, this decrease will continue for at least ten years. In other words, our past and present enrollments increases are partially due to the baby boom experienced after World War II. But from about 1960, the birth rate went down, and enrollments will not go up again until the children of the baby-boom population will start to enter the universities and colleges. Thus, steady enrollment decreases in the ensuing years could

CHART 6

Supply and utilization of science and engineering doctorates, by field of science, 1969 and 1980.



Source: National Science Foundation

cause serious difficulties for life and social science doctorates in the decade of the 80's. This is important to recognize now because the students who will be entering graduate schools in 1975-76 will be the new Ph.D.'s of the early 80's.

Summary

Let me then summarize what our latest projections seem to indicate. We still project that, with the exception of engineering and the social sciences, science doctorate utilization and supply will be roughly in equilibrium by 1980. It is significant that these new projections show a narrowing of the overlap between supply and demand, and continuous evaluations will have to be made. It seems quite clear that we are not likely to have a situation of gross Ph.D. shortages. Of course, shortages in specific subfields are still quite possible. Furthermore, if students for a variety of reasons become sufficiently disenchanted with careers in science, then an overall shortage could develop.

It is also clear from these projections that possibly as many as half of the Ph.D.'s produced between now and 1980 will be employed in non-R and D, non-graduate academic positions and will work as practitioners, mangagers and administrators, post-development scientists and engineers in industry, or teachers in two- and four-year colleges. This places a very heavy responsibility on the graduate schools to broaden their curricula, to seriously consider the development of non-research-oriented curricula and possibly also practitioner degrees. In our projections, the concept of "doctorate" is used in its broadest sense, namely, a degree beyond the master's degree. However, it could be a Doctor of Arts degree, any other type of practitioner doctorate, or a conventional research-oriented doctorate.

The final conclusion is probably the most obvious one, namely, that it is necessary to revise projections periodically, especially when factors are changing very rapidly. What one projects now may no longer constitute a good projection two years hence. Thus, we at NSF intend to update our projections from time to time, just as we produced this revised projection.

J. Wayne Reitz

THE OUTLOOK FROM THE FEDERAL GOVERNMENT

One of the characteristics of the Washington scene is that it never stays the same very long. The top leadership, for example, in both the Department and the Office of Education, in which I serve, has changed in the past year. The legislative proposals for higher education have been discussed and debated in Washington and, I think it is fair to say, rather substantially modified. In this period of continuing budget stringency, proposals involving major new expenditures are unlikely to be supported. At the same time, there are indications of a new Administration resolve to consult with the higher education community before basic policy changes are made or new legislative proposals are advanced. I think this is of very much interest to you and promises an improvement in relationships between the federal establishment and higher education.

The impact this changing scene may have on the doctoral population remains to be seen; but in any event, as I have indicated, my remarks are not focused on the doctoral population from the demand side of the federal government but, rather, they are intended to explore present and future support by the federal government of graduate education at the doctoral level.

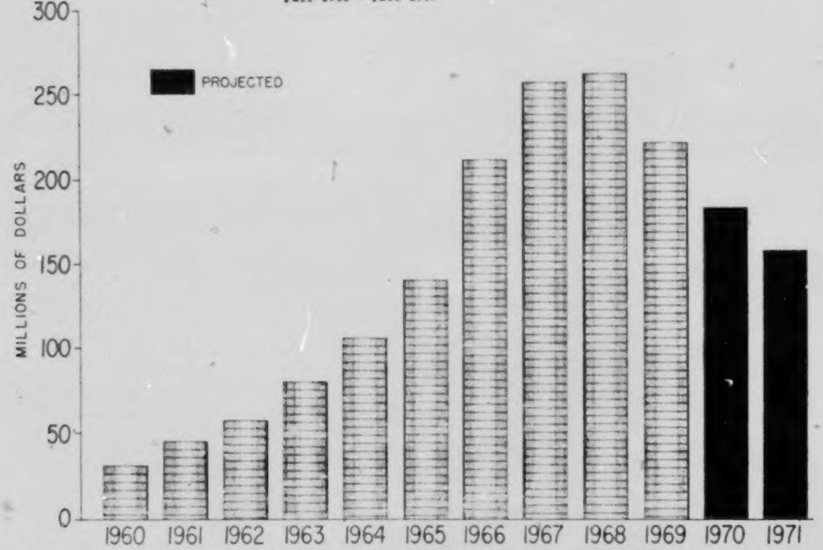
Large scale federal support for doctoral study without restriction as to field began with the National Defense Education Act of 1958. The twofold objective, for example, of Title IV was to increase the number of well qualified college and university faculty and to increase the number of strong doctoral programs throughout the nation. Of course, there were earlier federal programs, which are still continuing, with more specific objectives--particularly those of the National Science Foundation and the training grants of the National Institutes of Health.

There were later programs that provided assistance for construction of academic facilities through the Higher Education Facilities Act of 1963, for libraries and higher education personnel training with the Higher Education Act of 1965, and the amendment by way of the Education Professions Development Act of 1967.

The period of legislative creativity and of substantial funding increases for new programs lasted for approximately ten years. We are now in a period of declining support, as is shown clearly in Figure 1 (p. 30), taken from the report of 1970 Federal Interagency Committee on Education. These data show that funds for fellowships and traineeships increased from about twenty-five million dollars in 1960 to a peak of over two hundred and fifty million in 1968. In the last three years there have been progressive decreases to a level of one hundred and fifty million dollars projected for 1971.

Table 1 (p. 30) shows the figures for full-time graduate enrollment, total fellowship and traineeship awards, and the awards as a percent of full-time enrollment over the past decade. The number of awards was greatest in 1968-1969, although because of a growing student population the awards as a percent of enrollment reached a high of 17 percent a year earlier. The number of awards projected for 1971 is nearly one-third less than in 1968-69, and awards as a percent of enrollments

Figure 1. Federal Funding for Fellowships and Trainships
Fall 1960 - Fall 1969



Source: FEDERAL INTERAGENCY COMMITTEE ON EDUCATION, Report on Federal Predoctoral Student Support, Part I - Fellowships and Traineeships, April, 1970.

Table 1. Full-time Graduate Enrollment, Number of NDEA, IV Awards, and Number and Percent of Full-time Students Supported by Federal Fellowships and Traineeships, 1960-61 through 1970-71*

Years	Full-Time Graduate Enrollment	Number of Federal Awards		Percent of all Full-time Students Supported
		Total	NDEA, Title IV	
1960-61	124,689	7,999	2,500	6.4
1961-62	132,675	11,591	4,000	8.7
1962-63	148,426	13,528	4,500	9.1
1963-64	163,463	15,601	4,500	9.5
1964-65	196,820	20,442	4,500	10.4
1965-66	230,907	26,425	6,000	11.4
1966-67	258,165	40,007	10,500	15.5
1967-68	301,140	51,289	15,000	17.0
1968-69	322,000	51,446	15,328	16.0
1969-70	354,200	42,551	12,233	12.0
1970-71**	380,000	34,834	8,603	9.0

*Does not include students supported by Training Grants or working as Research Assistants.

** 1970-71 figures are estimates

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON EDUCATION, Report on Federal Predoctoral Student Support, Part I - Fellowships and Traineeships, April, 1970 are down to 9 percent. The figures for NDEA Title IV show the same rapid build-up, from a total of 4500 for each of three years in the early 1960's to over 15,000 in 1967-68 and 1968-69, followed by a sharp drop to 8600 in 1970-71. A reduction to 8200 is projected for 1971-72. In the early years of the Title IV program, the number of new three-year awards was 1500 per year; this number was doubled in 1965, and again doubled to 6000 in 1966 amd 1967. We are now at the level of 2100 new three-year fellowships, as compared with 2370 this past year.

There is going to be a little bonus over the 2100 new awards for the coming year. Without going into details as to how it happened, we expect to have about 850 one-year fellowships that can be added to your quota for the coming year. Notification will be made of those around March 1. These additional fellowships can be used to meet the needs of returning veterans, for interrupted or vacated fellowships, or for fourth-year NDEA Fellows.

The up and down trends of federal support for doctoral education in general, and Title IV in particular, seem to illustrate the perils of succeeding too well. Of course, it is not only the increase in degree output that is responsible but also the sizable cuts in federal R and D expenditutes. In early years the rising level of these expenditures permitted the rapid absorption of new doctoral graduates, particularly in the sciences, in defense-related industry or government programs. But in recent years, particularly the last two, government and industry have been employing fewer of the new graduates. The result is a new labor-market situation in which assistant professorships at research-oriented universities or in good liberal arts colleges are no longer readily available for the new doctoral graduate.

The change in the job climate has understandably produced a good deal of concern and even alarm, especially among students nearing the end of their doctoral studies.

A direct consequence of the reduction in federal fellowship support has been the decision of a number of institutions to reduce their graduate-school admissions. The reduced demand for doctorates has also had its impact. A number of institutions, including some of the more prestigious graduate schools, have already announced such reductions; and I have no doubt others will be taking similar actions. A further direct consequence of federal policy will be to discourage institutions from planning to launch new doctoral programs. A few years ago they could reasonably have expected some fellowship support. Today, when the total number of fellowships is declining, it is difficult to justify such support when there are so many well established, highly regarded programs. In retrospect, it is apparent that federal programs gave encouragement to too many universities to embark upon doctoral programs.

I believe that the watchword for the 1970's, not only with respect to federal support but within the higher education community itself, will be to limit or even reduce the number of doctoral programs and improve the quality of those that remain.

In addition to the direct consequences of reduced federal fellowships, there will, of course, be indirect consequences. Faculty members and graduate students also read the newspapers and the national journals and will draw their own conclusions from the generally pessimistic accounts that seem to have become so fashionable. Thus, the possibility of an overreaction in the way of federal support is very real and very serious.

And that leads me to conclude by mentioning some of the questions that are being asked of us these days in Washington. Partly as a result of the new conditions in the labor market and partly because of rigid restrictions on federal expenditures, there is going on within the federal government a spirited debate over the future of federal support for advanced graduate study. Pointed questions are being asked by top officials in the Office of Management and Budget. Among them are the following:

1. Since federal R and D support is declining, why is there any need to stimulate the production of doctorates through fellowship support?
2. Since major financial benefits accrue to individuals undergoing advanced education, why shouldn't graduate students be expected to borrow the funds needed to finance their education?
3. Since the supply of college teachers in most academic fields now seems adequate, is there any need to continue programs whose major objectives have been in the past the preparation of college and university teachers, such as through the NDEA Title IV program?
4. Since previous efforts to protect supply of and demand for doctoral graduates have not been conspicuously successful, perhaps the free market is the best way to allocate resources. So why let the federal government be concerned about them?
5. Doctoral education, after all, affects only a small number of our population of America's young people, but a much larger number of young people are denied the opportunity for a college education because of cultural, social, and economic handicaps. Doesn't equalizing educational opportunities for these people become a more important objective than supporting a small number of students at the most advanced level?

The answers to these questions will in large part determine the nature of federal policies in fiscal '72 and the immediate years ahead. Some indication of these answers will, of course, become available when the President issues his budget message in January. In advance of that message it seems reasonable to assume that the following objectives will continue to have a high priority in Admininstrative thinking:

1. Continued emphasis in assisting the disadvantaged.
2. More support for fields where it can be shown that deficits exist, such as the whole range of environmental and ecological studies, transportation, and urban problems.
3. Continued interest to insure strength in quality of graduate programs by geographic areas.
4. Some form of non-categorical institutional support.
5. The stabilization of federal support at near present levels.

The last-listed item is particularly important if an overreaction to the present situation is to be avoided. The symbolic importance of some government support is extremely important. Potential graduate students need to feel that society approves of their efforts to achieve advanced training, and a tangible evidence of that approval is extremely important. Furthermore, both students and institutions need the assurance of continuity in order to make sensible long-range plans. For these and other reasons I believe that present federal fellowship and traineeship programs should be maintained at approximately their present levels. To do less could be at our own peril; however, increases, except for general institutional support, will have to await in all probability a further clarification of some of the questions now being asked.

T. L. Cairns

THE OUTLOOK FROM INDUSTRY

Dr. Pelczar gave me a bit of an opening by reading out of the newspaper, and I thought I would start off the same way. This is now a quote: "In some quarters a senseless fear of science seems to have taken hold. We hear the cry that there should be a holiday in scientific research and in the new applications of science or that there should be a forced stoppage in extension of old usages by mandatory legislation." That takes care of that point.

On the job situation, I have a quote from a letter written by the head of the department. I am editing it only to the extent of leaving out the actual name of the school: "I haven't the faintest idea of where your former student can get a job. Our department is filled with our own Ph.D.'s hoping for a small stipend. It is a shame that these able men should be without positions. I am hoping that conditions will improve soon."

Well, I chose to read those, and I was impressed that they sounded not unlike what Dr. Pelczar read. Both of these quotes were written in 1932.

My point simply is that times have been bad before, and they have gotten better. When times are bad, institutions are attacked. I think that has been true throughout all of history. And science is an institution, universities are institutions, and so is the federal government.

I would like to make some brief comments. I want first to talk a minute about interdisciplinary research in the universities; I want to say a word about the absolute numbers of Ph.D.-granting institutions; and then finish up by combining a few words about changes in curricula and the needs of industry.

It is my opinion that many of the current problems that face society are going to find their solutions through interdisciplinary research. Environmental improvement for example will certainly come about through interdisciplinary attacks.

There is a certain tendency among my colleagues in industry and in the universities to forget that photochemical smog is made up of molecules; these molecules are still made up of atoms; they still obey some of the laws which Dr. Alberty used to teach in elementary physical chemistry; and, of course, they still are subject to the laws of meteorology.

It seems to me that when we discuss an interdisciplinary attack, we are talking about solving a problem by using the most advanced knowledge available in the classical disciplines. I can't quite see how today there is such a thing as an environmental scientist who hasn't first been an outstanding chemist, an outstanding biologist, or an outstanding engineer. Interdisciplinarity is for the older folks—I mean over thirty perhaps. Of course, I am not opposed to survey courses in general science at either the undergraduate or the graduate level. These can be very interesting and exciting, but if universities are to solve some of our environmental problems, they will have to do so with postdoctoral assistance.

Part of my plea here is that we move to the support of interdisciplinary activity in the universities, but I believe it would be a great mistake to do so by weakening the classical disciplinary departments. I am very much in favor of the physicists talking to and working with the chemists, but I still think there are forefronts in physics and in chemistry that it is in the national interest to have explored by excellent men.

I want to turn now to the question of the numbers of Ph.D.-granting institutions, and my remarks here are strictly limited to chemistry. In these comments I am drawing on a publication by the National Research Council, reporting on the annual meeting which was held last March. By and large most of these data have been collected by an A.C.S. committee headed by Cheves Walling, of the University of Utah.

There have been about ten new Ph.D.-granting institutions in chemistry formed each year for the last ten years. The number went from 125 in about 1960 to something a shade over 180 today. There were 1900 Ph.D.'s in chemistry granted in June of 1969, and 1800 of these were granted by the 125 schools that existed prior to 1960. Only 140 of the 1900 were granted by the 50 schools organized since 1960. The arithmetic works out that the old institutions, the prior-to-1960 institutions, in 1969 averaged 14 Ph.D.'s granted per institution, while the 50 new institutions averaged 2.8. This, to me, proves that establishing a new Ph.D. program is a very, very difficult thing to do. In these 180 or 185 schools granting Ph.D.'s in chemistry, there are 3700 qualified faculty members and the 3700 qualified faculty members granted 1900 doctorates in 1969. This comes out to about an average of about one-half Ph.D. per qualified faculty member per year.

Considering the problem of financing the universities, the federal problem, it seems to me that a good argument can be made that for the immediate future—perhaps five, maybe more, years—it is questionable that we need more Ph.D.-granting institutions in chemistry. There are distinguished professors of chemistry who have averaged over a working lifetime substantially more than one-half Ph.D. per year. If we could just even bring that to one Ph.D. per year, it would then mean that we have the physical facilities, we have the plant, we have the faculty to double the production of Ph.D.'s in chemistry. And I think it is a little unlikely that in the immediate future we would need to double this number.

There are, of course, many easily understood driving forces that leads a four-year institution to want to add a Ph.D. program. I won't enumerate these; I want to comment on just one.

I really don't believe that there is any geographic justification. This is certainly true, in my opinion, for full-time students in chemistry. It may be that there is a geographic justification for graduate programs in chemistry in some areas where part-time students need that opportunity. That's a point I have not seen properly investigated.

Rather than seek to establish Ph.D. programs in chemistry, I think that it might be more salutary for the departments in four-year institutions to strengthen themselves by arranging, for example, to grant more frequent and extensive leaves to faculty members. I think that the building up of a technical staff to help in the conduct of research would also be desirable. And I would also like to see more post-doctoral appointments so that faculty in four-year colleges can, in [illegible] something constructive accomplished in research.

I would like to finish up by combining a few points on curriculum and the needs of industry.

Certainly the curriculum and the changes in it is a continuing study, a continuing problem. I have seen it estimated several places that the substantive half life content of a course in physical science is about seven years. So every seven years, half of what is being taught wasn't known or was not in the course seven years ago.

On the other hand, I think that the details of a curriculum are very much less important than the atmosphere and attitude in which the graduate student is brought up. I believe that it has been frequently stated, and it is part of my own experience, that the recent Ph.D.'s really need a greater degree of flexibility in their outlook toward science and toward chemistry.

I think new Ph.D.'s should be encouraged to develop an awareness of peripheral fields. I hope they can develop an eagerness to solve problems and not just to refine data. And most importantly of all, I hope the new Ph.D.'s will come out with a really well-developed confidence in their own ability to master a new subject, to become involved and interested in a new topic.

Now, to turn to the manpower needs in industry, about which there is certainly a great deal of confusion. The supply of scientists and engineers has been increasing by about 6 percent in the past few years. and except for short-term discontinuities, this has held fairly constant. I think we are in the midst of a short-term discontinuity from industry's point of view right now. And while our own company has tried very hard to resist the short-term pressures so that we have a continuing recruiting program and a consistent one so that we don't develop a technical staff with gaps in it, I must say the pressures in the past two years have made it exceedingly difficult; difficult enough so that we have reduced our recruting in 1970 and will again in 1971. I hope you don't think I am simply looking for sympathy, but I would like to illustrate how inflation has affected our company in one specific way. I saw in the paper this morning that the wage-rate inflation in the construction industry was 7.8 percent for the past 12 months. Our construction figure this year, which has been published, is about four hundred and eighty million dollars. If one takes just the inflation figure for wage rates alone in just our construction, leaving out our manufacturing and research, this comes out to about fifty to sixty thousand dollars per day added cost to duPont. Now, that is just about what it cost us to hire a Ph.D. and keep him for a full year.

So in the past twelve months we have lost what would have been the equivalent of hiring 365 Ph.D.'s for one year. But that is only one part of the cost of doing business, and I thought it was perhaps worth mentioning to illustrate how difficult it is for industry to take the really long-range point of view.

We are quite confident that our recruting will go up. Our needs will go up as our business goes up, but it has been an exceedingly difficult time.

All the pressures you have heard about today, the reduction in federal funds, the blaming of the environmental problems on science and technology, the urgent social need for good people to go into politics and solve some of our problems, I am afraid, will lead to a very substantial dropping off in registrations in science and engineering, and we may find ourselves not with an excess only a few years from now but rather with a great shortage of really well-trained, well-educated Ph.D. scientists and engineers.

Robert Alberty

THE OUTLOOK FROM THE UNIVERSITY (THE NATURAL SCIENCES)

As an alumnus of the Council of Graduate Schools, it is a great pleasure for me to be back and have a chance to see so many old friends.

These are times that make us ask some very basic questions about doctoral education. How many persons with doctoral degrees are needed? What will they be doing during their lifetimes? How should the cost of their education be paid? Are there some students in our graduate schools who shouldn't be there, or who have been there too long? What is the best education we can give them?

I would like to spend my time on another set of three difficult questions that I don't pretend to be able to answer, but questions that I think we should be struggling with. The first one is: What is the job situation going to be for people with doctoral degrees in the natural sciences? The second one is: How many graduate students should there be in the natural sciences? And the third: How can we improve graduate study in the natural sciences?

First, with respect to the job market, our experience at M.I.T. last spring was that the new Ph.D.'s in physics and chemistry did not have the opportunity to select from very many competing offers, but they did get jobs. The biologists and the biochemists, the earth scientists and the mathematicians, on the other hand, did not report any difficulty in finding jobs. And I note that within the fields of physics and chemistry there was a great deal of difference, depending upon the subfield and the type of activities these people were involved in.

However, we look forward to next spring with a good deal of apprehension. The number of industrial interviewers who will be visiting our campus is down significantly, and we are afraid that the hiring of new faculty by other institutions will be down, as it will be at M.I.T.

Thinking about the job market in the natural sciences, there are three main sectors that I think we have to keep in mind—industry, government, and higher education. Ted Cairns has told us about the outlook from industry, and I cannot add to that. I would simply like to emphasize that we must be careful not to confuse short-term cycling of the economy with long-term needs of the country.

Unfortunately, the time cycle for producing doctorates is sufficiently long so that it is difficult to adjust doctoral production for these short-term fluctuations. In looking at the longer-term needs, I can't help but think that in providing for a growing population, with the increasing problems of pollution, delivery of adequate medical care, exhaustion of natural resoruces, and still an increasing demand for a higher standard of living, we shall require well-trained scientists and engineers in industry.

Although the federal government does not employ a very large fraction of the Ph.D.'s in the natural sciences, still federal and R and D programs do support many Ph.D. scientists through both universities and industry. Thus, job opportunities for Ph.D.'s in science are going to be greatly affected by federal support of R and D and the amount of R in that R and D. So far, most reductions in federal funding have been due to inflation, but the cumulative effect, as you all know, has been very serious; and I am afraid that at the present time we are in the midst of a leveling off of the number of active research scientists. If the present trends continue, there will be an actual diminishment of the number of active research scientists in this country.

It is only when we come to the higher education sector that we can see an area that will probably grow at a significant rate in the next several years. Perhaps you noticed, as I did, that the U.S. Office of Education has just finished counting the degree-credit enrollment in United States universities this fall, and they find it is 8.55 million students, which is an increase of about 7.2 percent over last year. This is actually a faster rate of growth than the Office of Education is predicting in its projections which are in press. These projections indicate the degree-credit enrollment in American universities and colleges will increase about 4.3 percent per year for the next several years, with the two-year colleges growing at a faster rate, 5.7 percent per year, and the four-year colleges growing at a rate of 3.6 percent per year. I might also refer to the NSF study, which was just released a few weeks ago, that showed the increase in science faculties between 1969 and 1970. This study showed that there was a growth of 4.5 percent in the chemistry faculties, 2.5 percent in physics faculties, and 3.0 percent in mathematics, and 5.5 percent in biochemistry.

But what about the future? I think higher education will continue to need more Ph.D.'s in the sciences, but the hiring rates will be a good deal lower than they have been.

Now, what about the number of graduate students that there should be in the natural sciences? Various data and calculations indicate that we are currently producing Ph.D.'s at a faster rate than they are needed, assuming that they receive a certain type of training and assuming that they are fitted only for a certain type of job.

One way to see how serious this problem may be is to divide the annual Ph.D. production, as reported by the National Research Council, by the number of employed Ph.D.'s in 1968, as reported by the National Registry of Scientific and Technical Personnel. Although these latter numbers are not complete, they perhaps represent 80 to 90 percent of the working Ph.D.'s in the country, and so I think they are probably good enough for this purpose.

In chemistry the doctoral production is 6.7 percent per year on this basis; in the earth sciences, 9.2 percent; in physics, 10.1 percent; in mathematics, 15.4 percent; in biological sciences, 20.4 percent.

Now, even allowing for retirements, transfers into other fields, and the development of new fields, these figures cannot continue indefinitely in the future without growing opportunities for people with this training.

There are several different courses of action. One is to reduce the Ph.D. production in science. Another is to change the nature of the training. And a third is for new Ph.D.'s to seek different types of jobs than they have in the past. Actually, I do not see any one of these as "the" solution to current problems, but I see some features of each of these possible solutions being followed simultaneously.

First of all, the Ph.D. production in science in the country is being reduced. At M.I.T. the enrollment in the Graduate School and the School of Science is down 8 percent from last year, and the number of entering graduate students is down a good deal from that.

It would be nice actually if we had data for the country as a whole, but I am not aware of the kind of data we really need to understand current rates.

I am one of those who believes the country is going to continue to need Ph.D.'s out of the present mold; that is, men and women who have experience in the advancement of science at the frontier and who want to pursue this activity and to train students at an advanced level. In my view, the opportunities for advancing basic science are greater than ever, and I think there will be major discoveries of tremendous importance to our society during the foreseeable future. For this reason, I am really unhappy with reduction in federal fellowship programs, which have been permitting our very best students to develop their own course of action and to pursue what they think would be the most promising careers for them in the future. And I think what Wayne Reitz's graphs show, that there has been a 40 or 50 percent reduction in these federal programs, is very bad for these stronger students.

Now we come to my final question: How can we improve graduate study in the natural sciences? In contrast with the first two questions, I think this is a question that the graduate deans and their faculties can answer. I know that graduate deans have been talking about new types of doctoral programs, and I think some new ones are needed; but I would like to emphasize that I do not think we are actually using the flexibility that is inherent in many of our current programs.

I note that the Economic Concerns Committee of the American Physical Society has just prepared a report in which they say, "We should counsel graduate students toward a well-grounded training in fundamentals, carried through with the broadest attitudes and wisest divisions." And in this report, they quote John Gardner in his book *Excellence* of about ten years ago, saying:

> Nothing contributes more damagingly to the unemployment of educated talent than rigid specialization and rigid attitudes supporitng this specialization. The future is necessarily hazardous for the individual who trains himself to do a specific job, receives an advanced degree for that line of work, and believes that society owes him a living for doing it.

I think, in quoting John Gardner here, I am repeating things that other members of the panel are also saying. I think, in other words, that we need to train students, as we have been doing, for exploration of science at the frontiers; we need to train students with an interest in contributing to the solution of society's problems and to taking on broader responsibilities in industry; we need to train students who will take increased interest in teaching. In the science area especially, we need to be much more concerned with the job of teaching science to the non-scientists than we have in the immediate past.

In conclusion, I think this is the time for us to reexamine our programs, to identify their basic strengths and correct their weaknesses, and I hope that five years from now we will be able to look back and say this was a period that brought about major improvements in graduate programs.

Richard P. Adams

THE OUTLOOK FROM THE UNIVERSITY (THE HUMANITIES)

I'd like to begin by saying just a word about the importance of the liberal arts in the general scheme of things, as I see it. I think that one of the things we most need to cultivate is human imagination. We have reached the point now, technologically, where we can have pretty much any kind of world we want. But I am not sure we have come to the point where we are sufficiently able to imagine the kind of world we ought to have. Inasmuch as imagination is the business of the liberal arts, I think it is essential that they be healthy. My concern about the topics we are discussing is based on that assumption.

I had the privilege last month of attending a conference sponsored by the Association of Departments of English, which was called a "bellwether conference." I wasn't altogether happy about that; I don't think I'm that kind of sheep—but that's what they called it. It was about the job market and the Ph.D. programs, specifically in English, and there was a good deal of moaning and wringing of hands, as you can imagine. But after we settled down a bit, the recommendations took a line that I for one found more sensible than I had quite dared to hope.

The conference began with a bitter complaint about what was called "the Ph.D.," and that put me on edge, because as you all know there is no such thing as "the Ph.D." There are as many Ph.D.'s as there are holders of Ph.D.'s, and there are at least as many kinds of Ph.D.'s as there are Ph.D. programs. It isn't at all the monolithic thing that the phrase "the Ph.D." seems to imply.

The complaint was that "the Ph.D." is a very narrow, specialized, research degree, and that therefore it not only does not prepare people to teach in undergraduate institutions of higher learning, but actually unfits them for that duty.

Well, this complaint came from a gentleman who works in New York City, and of course New York City is well known as being perhaps the most provincial place on earth. It seemed to me that conditions out in the boondocks—the foggy swamps of Louisiana, for example—weren't quite that way. The fact is that something like 95 percent of Ph.D.'s in English go out and teach English, and I had thought that we were well aware of that fact and that our programs were designed with it in mind. The recommendations we finally came to were along the line of the kind of flexibility that my colleagues in the sciences have just been talking about; that is, that we must convince our Ph.D. candidates that they are preparing for teaching careers; we must guarantee that they are able to teach well; and we must do what we can to stimulate their interest in teaching as a career. There are no jobs in pure research in the liberal arts, and I think there are not very many in the social sciences.

Now, it's true that we do have a problem, although the loss of financial support for graduate programs and graduate students is not as traumatic in the liberal arts as it is in the sciences or, probably, in the social sciences because we never had as much. We managed to get along while our colleagues in the so-called "hard" sciences seemed to be prospering, and we never believed that thing about their prosperity spilling over on us. It didn't, and we knew it didn't. So we are not suffering quite the anguish that some of our friends are in that particular respect.

However, the job market is pinching us, and rather badly. Almost the only job market we have is in higher education, so that when salary budgets in higher education are squeezed, as they are now, our Ph.D. candidates have a hard time. The kind of flexibility we are talking about, inasmuch as it would make our Ph.D.'s more acceptable and more useful in undergraduate institutions, including two-year colleges of various kinds, is highly desirable.

A good many people are feeling guilty because they believe we have overexpanded our Ph.D. programs. But actually the planning done ten years ago in anticipation of greatly expanded enrollments was not mistaken. The real demand was there, and is there. The percentage of Ph.D.'s on the faculties of institutions of higher learning is less now than it was then; so if there was a shortage ten years ago, there is a greater shortage now.

The crisis is budgetary, it's financial, and from that point of view it's quite real.

An obvious remedy is to reduce the supply of Ph.D.'s. Unfortunately, that is not a short-run solution. The pipeline is there, people are in it, and they will graduate in due course. Whatever we do now will not have much effect for at least four, five, or six years—by which time the market situation may be quite different. The presently continuing increase in undergraduate enrollments will have to be dealt with in some way.

If cutbacks are needed, it seems to me they should be made principally in two categories of Ph.D. programs. One would consist of those programs that were undertaken in a very laudable desire to supply a shortage of qualified college teachers, but which were and still are of dubious qualtiy. This is not a matter merely of eliminating the most recent ones, because some of them are very good. It should be a matter of setting criteria as to what constitutes a sound academic program toward the doctoral degree and suggesting somewhat pointedly to people whose programs don't measure up to those criteria that they should perhaps reconsider and abandon them.

The other category consists of programs conducted by high-powered institutions which are certainly capable of mounting sound academic programs but which have greatly expanded the numbers of Ph.D.'s they graduate. I think it might be suggested, again somewhat pointedly, to such institutions not that they go out of business but that they cut back numbers.

That leaves a category of programs which are academically sound, which have not greatly expanded, and which probably should continue pretty much as they are.

There has been considerable talk about a proposed new teaching degree, most often called a Doctor of Arts; and the Council of Graduate Schools has made some useful recommendations as to what sort of thing the Doctor of Arts, if it is adopted, ought to be. I have to report that most of the people gathered at the Association of Departments of English bellwether conference were not enthusiastic about the Doctor of Arts concept. They preferred to go with the idea that Ph.D. degrees are and should be sufficiently various to perform the functions for which the Doctor of Arts degree is designed. They felt that the Ph.D. doesn't have to be narrow and that it doesn't have to unfit people for undergraduate teaching.

There may be changes in policy needed in some Ph.D. programs. If indeed a given program is narrow, then I think it should be broadened. But I don't think that a new name for a degree is going to be of much use. I'm sure you have all heard the arguments pro and con; the only news I bring is the reaction of the English department chairmen at the bellwether conference.

QUESTIONS AND ANSWERS

A. A. Michel, University of New Hampshire: Dr. Adams recommended retrenchment in two areas, one being programs that were undertaken to supply college teachers but are of dubious quality. I think we would all subscribe to that.

The second area was programs in large institutions which have expanded their numbers. I would like to ask him why he would recommend retrenchment in the second category if those programs are of high quality?

R. P. Adams: I would suggest that the second category is also related to quality. I think that some of the powerful institutions that have greatly expanded their numbers of Ph.D. candidates have done so at some expense of quality, in the sense that the best faculty people in the departments concerned have less exposure to students than I would consider desirable. I think that a graduate program that has, say, four or five hundred Ph.D. candidates in English is just too damn big, no matter how you look at it. There is a mechanical quality about that kind of bigness, and students become alienated, and understandably so. I went thorugh a heavily populated program myself at Columbia shortly after World War II.

A Voice: It is smaller now.

R. P. Adams: I am happy to note that Columbia has seen the light. And I believe that their output of Ph.D.'s has not been reduced proportionally. There was considerable attrition in my day.

The problem in a big program is that the graduate students don't know each other; there's no *esprit de corps.* A smaller program tends to be better for morale, and I would suggest, better educationally.

Aside from the problems that students have because of large numbers, I would think that the programs that have greatly expanded are the ones that could most reasonably be expected to take the brunt of any necessary cutback. The institutions that have recently established Ph.D. programs are not responsible for much of the increased number of degrees granted. It is the established and greatly expanded programs that are mainly responsible for the surplus, if there is one; and I think they are chiefly responsible for making whatever cutbacks may be needed. Regardless what we may think of it morally, that seems to me to be the only practical way to reduce the supply of Ph.D.'s.

S. B. Barker, the University of Alabama in Birmingham: I was going to try to keep quiet because I didn't want to bring emerging institutions into this discussion; but since numbers have been brought up, I would move to point out to Dr. Cairns what I see as some discrepancy in his remarks.

One of them is the business of trying to cut an average across the whole productivity of Ph.D.'s per faculty man. When you come out with a half one per faculty person, this, of course, ranges all the way from a few zeros to some areas where there may be a hundred.

I would submit that when you start playing around with numbers, you really don't know where you stand.

We have already had the business of overexpanded departments called to our attention. There is in science graduate education, anyway, very definitely a critical mass. I would say that less than a half a dozen graduate students in chemistry, biology, physics, and many other areas represent too small a group, but I have a very strong feeling that a hundred will, *a priori*, have to break up into smaller groups; and I wonder why it is that we are condemning, *a priori*, universities that are moving into Ph.D. programs.

I am not speaking against quality—I am in favor of motherhood and against sin too—but I think that we realize that if a group of a hundred in a department is to be effective, it must break down into smaller groups; and I wonder why it is that an institution that has a dozen or twenty in a chemistry department cannot be effective?

I would also like to ask Dr. Cairns the justification for encouraging post-docs to go into departments where there is no encouragement of graduate study? I think that is a sterile approach.

T. L. Cairns: Certainly the comments made are well taken; the numbers game can be played indefinitely.

If you have an institution that has fifteen or twenty graduate students in chemistry and is working hard to get up to whatever the really ideal size is, let's say thirty or forty, is it really advisable for another institution thirty miles away to start off and add one graduate student, then two and three? This is what I am really talking about.

I don't know what the critical mass is, either; and I do agree, as our speaker representing the humanities pointed out, there are departments of science that are too big.

With respect to the question of the post-doc in a liberal arts college, a four-year institution, my idea here—and, of course, it is not original with me—is that this can provide the faculty member of a liberal arts college with a very effective way to get research done and keep himself up to date; and I think for a year it is a very valuable exposure to a young Ph.D. who has come from one of the larger schools. I don't think it is a sterile operation by any manner of means.

G. K. Fraenkel, Columbia University: I would like to raise two points, both of which have to do with economics.

First, on the question of support of black students. In the Graduate School at Columbia, and also in the undergraduate divisions, we have put a massive—and I use the word advisedly—amount of financial aid into the support of minority-group students. This has been done to such an extent that without outside support, either federal, state, or private, we cannot continue. We have increased the number of graduate students from minority groups in the entering class by a factor of five since 1968. Although we still have small numbers of minority students, the number in our current entering class is about 5 percent of the total; years ago it used to be very, very small indeed.

We support all of these minority students, whereas we do not by any means support even the majority of our other entering students. We cannot continue to do this from our own funds. In effect, this means that we will not be able to maintain even our current too small enrollment, at both the undergraduate and graduate levels, of minority students. This is a plain, hard fact.

The other fact about economics is this: When there is an established Ph.D. program, it does not save money to reduce the number of students. We all know that graduate education is the most expensive kind of education. But once there is an established program and there are facilities, whether they be in science, such as cyclotrons and other sorts of equipment, or whether they be in the non-sciences with libraries and tenure faculty, a reduction in enrollment does not cause savings, and results in an increased cost per student. After all, there are very few, if any, institutions that provide full support for all their students through their own institutional resources, and many institutions give relatively little support to their students through their own institutional resources. The fact is, certainly, that in private institutions, and also in some state institutions, students pay part of their way; many of them pay all of their way. Such students therefore represent income.

Let me go back to the particular example of English at Columbia in the days that Dr. Adams was here. In the 1940's and 50's, and perhaps earlier, we had a large M. A. program, and a relatively small fraction of the students continued on for the doctorate. The program had a quick turnover and large enrollments—often 200-250 students were admitted each year as compared to the current number of 60-65 students. These students in the M. A. program brought in a great deal of money. Thus our Ph. D. program in English today is a much, much more expensive one than it was, if expenditure is compared with income.

On the one hand, as a graduate dean, I must attempt to keep the total number of students in a large department, such as English, commensurate with our faculty and other resources; on the other hand, there is economic pressure to increase the tuition income by admitting large numbers of students, particularly into M. A. programs.

Thus, in established Ph.D. programs, we are really faced with a very severe financial problem relating to the size of our programs. There has been and will continue to be great pressure, I am sure, in private universities and in many state universities actually to increase the number of graduate students rather than to reduce the numbers.

Second Plenary Session: Reassessment of the Master's Degree

Wednesday, December 2, 8:00 p.m.

Presiding: Alvin H. Proctor, *Past Chairman, Council of Graduate Schools*
Henry V. Bohm *Wayne State University*
Francis M. Boddy, *University of Minnesota*
Jacob E. Cobb *Indiana State University*
Arliss L. Roaden, *Ohio State University*

Henry V. Bohm

THE MASTER'S IN SCIENCE AND ENGINEERING

My topic is the master's degree in science and engineering, and I want to start with a rather farfetched comparison. Let me compare the bachelor's degree to Jane Fonda—young, attractive, maybe a little hippie. Let me compare the Ph.D. to Raquel Welch—the former requires somewhat more development, and a more fully endowed structure. Then I think it is appropriate to compare the master's degree to Phyllis Diller.

Now, I take my assignment to cover all flavors of engineering and the natural sciences, both biological and physical sciences. I think there are some generalizations one can make and some points that split them apart.

Leaving engineering aside for a moment, there are, I think, three kinds of master's degrees. The first is the booby prize awarded at many of the Ph.D.-granting institutions to those doctoral aspirants who, for a variety of reasons—usually, but not always, including intellectual capacity—cannot make it through the Ph.D. Most frequently that is a degree without a formal thesis requirement in which the student has spent too much time because the administrative machinery at some level either didn't have the heart or the guts to say good-bye to the man at an earlier stage or didn't insist on a tighter time schedule for a doctoral qualifying or preliminary exam. The fact that it is not easy to arrive at a judgment of the student's capacity early in his graduate career, particularly if he comes with a less than average quality or quantity of preparation, is an explanation, but it is not a valid excuse. In my experience most students are not made specifically and explicitly aware right from the start how long they may be left in limbo before a definite decision is made to stop them at the master's degree or to permit them to go on to the Ph.D.

The second kind of master's degree is the one that at some schools, either inevitably or at least for the less than outstanding students, is expected to come en route to the Ph.D. It usually also has no thesis requirement, and most often it is a matter of accumulating a certain number of credits, at which time the departmental and university machinery grinds into action and eventually spits out a master's degree.

I think there is something to be said for this kind of a master's degree, compared with the one I described previously, providing the student is told at that point: "From here on in you are gambling on your own time whether you can make it through the Ph.D. You may, in fact, be investing one, two, or even three years and at the end of that time have nothing more to show for your time." I think that's fair.

There is another use for this kind of master's degree, particularly in schools such as my own where we have large numbers of first-generation-in-college students. If you talk to the student who is the first in his family to earn a bachelor's degree in his senior undergraduate year about undertaking a Ph.D. program, you just may frighten him off from undertaking any graduate study, usually because of family pressure. The attitude at home, as I have seen it, is often, "You've climbed the mountain, you've got your bachelor's degree. Now go out and get a better job than your cousin who went to work after high school." Whereas he has had full family support as an undergraduate, when he gets into graduate school—particularly in the sciences, which are regarded as esoteric and not useful like law or medicine or social work—the family attitude very quickly often becomes one of suspicion that the graduate student is a failure or a loafer or just doesn't have the guts to go out and support himself in a normal job.

So the master's degree, which comes relatively quickly and, to a certain extent, automatically with a certain course completion, is a good level to which one can raise such a student's sights initially. When he has arrived there, one can then raise his sights higher. This master's degree is at a level and on a time scale which the family understands more readily than the Ph.D.

The third kind of master's degree is the one often given by independent colleges that either do not have a Ph.D. program or are just thinking about getting one underway. These, in general, are the master's degrees in the best traditional sense, requiring the small Ph.D.-type thesis, a certain level of competence in course work, a close personal interaction between a small number of students and the small number of faculty members of the department and, perhaps, neighboring departments. Typically, the student will take this master's degree at the same school where he took his undergraduate work and will then expect to go on to one of the major universities for his Ph.D. work.

While I applaud the substance of this master's degree, in which a student is likely to spend two or two and a half, even three years, frequently it is coupled with some sort of an assistant-instructor assignment in the department, I am sorry to say that I think in many cases this is a disservice to the student.

The research quality and sophistication of the Ph.D. institution far surpasses—and I am speaking of the sciences here—that of the small school. Thus, when the student gets to the major institution for his doctoral work, he finds that in summing up the time that he spent from the bachelor's to the doctor's degree, at least one year, if not one and one-half or two years, seem superfluous compared to the experience of his colleagues who started their graduate work at that major institution.

Additionally, at some schools and in some scientific disciplines—let me use organic chemistry as the whipping boy—the student is at an initial disadvantage for not having commenced work in the research laboratory of his proposed Ph.D. professor.

Now, there may be some other advantages to the kind of master's degree I have just described. Some students are simply not ready to be thrown into a big pond. Others would like to "try out" a career of serving at a primarily four-year undergraduate college; and in these two years that he spends as a master's degree student he gains an insight, certainly much more than he ever would or did as an undergraduate, into this kind of life and career as a college faculty member and can thereafter have a better idea of whether such a career is likely to appeal to him.

These, then, are the three prototype master's degrees in the sciences; the booby prize, the automatic, and the tough one. I should note that in different departments at the same university you may, in fact, find examples of each one, even though I characterized one as being found primarily at small and independent schools.

To the best of my ability to observe, in the last five years the master's degree as a professional degree in engineering worthy of full-time study has suffered a good deal of downgrading. And the Ph.D. in engineering, much more theoretical in nature, has and is being pushed hard.

I find myself regretting this development, particularly in view of Dr. Falk's remarks this afternoon. I regret it even though it means turning out engineers with greater prestige, *vis-à-vis* their scientific colleagues and, perhaps more substantively, engineers who are more educated to think independently and who can better communicate with their scientific and occasionally their social-science colleagues.

I think the need has been demonstrated for this more highfalutin type of Ph.D. engineer. But on the other hand, it seems to me that the engineer who can read steamtables in order to design and build and operate a turboelectric power plant (atomic energy or not) and the engineer who still knows how to set up the long and drawnout calculations necessary to design a Verrazano Narrows Bridge, is still a useful guy.

The trend I observe in engineering schools is to educate graduate students in a much more theoretical and esoteric set of problems than previously. There is nothing wrong with that provided that neither the students nor the faculty lose sight of the fact that a good many nuts and bolts engineers are and will be needed. These are the guys who can organize the task of draining a swamp—for example, a Miami Beach swamp—or the guys who know what switches to throw in this enormous interlocked national electric power network that we are moving toward, so that when I blow a fuse in my home in Detroit, Salt Lake City or some other place isn't without lights for a week. This is not the kind of engineer I think that the Ph.D. is preparing students to become.

Many of you will have seen or heard some of the statistics recently developed by Chancellor Cartter. In a much oversimplified way, as I understand his projections, for the 70's we are turning out Ph.D.'s in engineering and the sciences at a roughly sufficient rate to meet the needs of our society. This afternoon's program certainly addressed itself to this topic. I am certain that this does not mean we are turning out exactly the right distribution or that we are always turning out good quality people, but I think one is led to take a look at the master's degree as a useful level of educational accomplishment, particularly for people engaged in the applied sciences, the development and the operating end of the business as contrasted to pure research.

Even in pure research there is a gap in available numbers of highly skilled and trained technicians—supertechnicians, if you like—which can be filled and has in the past been filled at the master's degree level.

There seems to be a trend toward part-time study at the master's degree level. Indeed, in engineering it is not uncommon today; and certainly outside of the sciences and engineering, in the professional education field, it is rather more normal than exceptional. Personally, I don't necessarily applaud this development, but I do think, particularly in view of the limited funds available for graduate research and the support of students in the sciences, this trend will increase during the present decade. A natural corollary of part-time study towards the master's degree seems to me to be a further de-emphasis of the research and thesis part of the master's degree requirement. I don't claim that this is necessarily good, but I think we all need to be aware of it.

Dean Stephen Spurr, of the University of Michigan, when he was speaking at the October 1970 conference on "Changing Patterns in Graduate Education," held in St. Louis, spoke about flexible entry and exit ports for students undertaking study at the graduate level. I think part-time study, even with those characteristics that are undesirable, is a necessary part of that flexibility.

A hopeful sign I think I see, perhaps more in engineering than elsewhere but also in the sciences in general, is that at the master's level we are beginning to develop some hyphenated degrees; that is to say, some master's degrees in engineering and the sciences hyphenated with some of the social sciences. The kind of modern engineering and applied science problem that would appear to be relevant today and perhaps for the next twenty years often requires a greater understanding, or at least a greater awareness, of the social fabric of our society than has been traditionally provided by graduate education in the sciences and engineering that we have offered the students in the past thirty or forty years. Apart from the relatively small number of "deep thinkers," that is, frontier researchers, the need, the opportunities, and the openings for really large numbers of operationally qualified people are there and are growing. In my estimation, these are the people we now think of as being at the master's degree level. Put a little differently, these are the practitioners Dr. Mina Rees mentioned this afternoon.

I want to emphasize very strongly that when I speak of these hyphenated degrees, I think they are only useful if they have real substance and not just P.R. sound and fury. An environmental master's degree cannot be just a handful of old elementary biology courses mixed in equal or unequal proportion with a handful of elementary economics and sociology courses. That's simply the education of a dilettante.

I would hope that these master's-degree-level programs, if and as they develop, will tend to be more academic than professional in the sense that they will be reasonably broad and teach the student how to think about the problems of interest rather than merely enable the student to become well-versed in one very small, very specific area. The allied health care area is an area of great need and of some development in this kind of degree.

I have not quoted any figures, shown graphs or slides, but rather rambled on in an unscientific fashion. I wouldn't feel quite right without quoting at least one reasonably quantitative comparison. As badly and unevenly as we collectively turn out master's degree students in the sciences and engineering, I think the following very rough comparison is a sign that things perhaps could be worse. If over the last three years one takes the ratios of master's to bachelor's degrees in all of the traditional university disciplines lumped together, and the ratio of the Ph.D. to the bachelor's degrees awarded in these same areas, in the first case one arrives at a number of about a 25 percent; in the second case, at about 3.4 percent. If one goes through the same exercise specifically for the sciences and engineering, as I have used these terms here, the biological and physical sciences, math and engineering, one arrives at a master's to bachelor's degree ratio of about 40 to 45 percent; and a Ph.D. to bachelor's ratio of about 12 percent. In other words, science and engineering students continue from the bachelor's degree into master's degree work with a frequency almost twice as high as those in all of the traditional disciplines combined.

Perhaps one can interpret this as indicating that the science and engineering students find at least some things worthwhile in these graduate programs more often than other students do in their graduate programs.

Francis M. Boddy

THE MASTER'S IN SOCIAL SCIENCES AND HUMANITIES

I would like to start with a rather simple idea, which I am sure is wrong because it is simple. But it gives me, at least, some feeling for how the master's degree may fit in into the hierarchy of college degrees.

I like to compare the master's degree to the other degrees because you always have to say when you are comparing something, what you are comparing it with.

I have a feeling that I can categorize three levels of degrees. The bachelor's degree program is essentially what the American system uses for what we may call general education. And specifically in the fields of social science and humanities, I suppose its purpose to be the basic understanding of the liberal arts; that it is supposed to train people, teach people, introduce people to the main philosophical ideas about society and the way in which values are determined in society. This is how I would oversimplify the humanities side of it.

The social science side essentially can be regarded as being an attempt to explain in some rather simple but useful form the structure of society; that is, a framework for the understanding of social systems. And as an economist, I suppose I would claim some priority in terms of time and perhaps even priority in terms of the extent to which that discipline has developed by saying that the primary purpose, in one aspect of our field at least, is to understand how the economic systems—not just our own system, but the various economic systems—work.

In the bachelor's program we try to emphasize and re-emphasize, I think, the simple ideas about social systems in the social science side; and the basic ideas about the development of value systems and the appreciation of values on the humanities side.

Largely, even in the major doctoral institutions such as my own, we place heavy emphasis on this at the undergraduate level.

Obviously this varies from field to field. In chemistry, by contrast, it is quite common that students specialize, and specialize rather intensely, at a rather early date.

In my own field of economics, most of the major economics departments around the country hope that their prospective graduate students have had something beyond the first principles course in economics, but they are frequently more interested in how much math they have had than how much more economics they have had. Specialization can be and frequently is relatively minor at the undergraduate level. The undergraduate major is still largely just a segment of what might be called general education.

In the master's degree, we are facing a situation in which you can name a master's degree or say what it is supposed to produce, and somewhere it is being given.

Some years ago the Office of Education published a rather interesting, if not very useful, manual on the titles of all the various degrees given by educational institutions. I was very intrigued to discover—Women's Lib please note—that there is a Mistress of Arts degree as well as a Master of Arts.

But the Master of Arts has become all things to all people, and when you look at the major institutions such as the ones I am most familiar with, you will find that a large block of the master's degrees are highly professional and practice-oriented. One of the largest master's programs at the University of Minnesota is the Master of Business Administration.

Other master's degrees of major size are in the general social sciences and humanities disciplines. But there are also the very professional degrees, such as the Master of Social Work. There is the type of master's degree—although it may go under the title of Master of Arts in history or economics or what not—that is somewhat professionally oriented. In the better colleges of education, when people who have experience in teaching or people who are going into the practice of teaching wish to go beyond their basic undergraduate studies in the field, they are quite likely to be encouraged to take not a major or master's degree in education but a master's degree in the field of their general subject matter.

So there is, I think, in the major institutions, a very heavy emphasis on what might be called job-oriented, professionally oriented types of master's degrees. I think this is quite appropriate. I think the institutions giving them are the most appropriate institutions to give them and by and large do a very efficient job.

But these types of degrees are not viewed, for the most part, as being a stepping-stone or an intermediate station on the way to a Ph.D.

Again it varies from field to field, but by and large I think a large block of our master's degrees, in the doctoral institutions at least, are of this rather specialized, not quite terminal type, but different from the kind of programs that a student going straight through to a Ph.D. would take.

The other type of master's degree is one that quite well can be taken and quite frequently is taken by a student who either starts off, or changes his mind, to use it as an intermediate station on the way to the Ph.D.

The master's degree at many institutions is not given as a consolation prize, but it is used, I think, as part of the evaluation of whether or not that student should go on the the Ph.D.

It is not that this terminal M.A. is worse than other M.A.'s—quite the contrary in the typical situation—but rather that perhaps the student has reached something like the ceiling of his present ability to pursue the subject.

I don't think the master's degree implies mastery of the subject. To me, attainment of a master's degree means that the student is familiar with the general areas of the subject, has some competence to develop on his own—but only some competence to do this in areas in which he has a particular interest and has sufficient basic mastery of the field to be called a historian or an economist or a chemist or whatever. But he is by no means at the level in which we can essentially certify that the institution can do no more for him, that any further education will have to be on his own. This is the appropriate criterion, I believe, of the Ph.D.

We have such a wide variety of master's degrees that I would like to distinguish between the more professionally practice-oriented types of degrees, such as are in education, business administration, social work and journalism and the master's degree in what might be called the liberal arts and social sciences as disciplines of their own, not primarily designed to satisfy some professional standards of competence or admission to practice.

It seems to me that the basic principle is that the recipients ought to have sufficient appreciation of the subject so that in good conscience both they and their institution can say that this person is a historian, a sociologist, an anthropologist, a master of fine arts, or whatever. But the difference between this and the Ph.D. is that the Ph.D. ought to be at the level at which the university says "We have performed certain useful functions in bringing you up to this level in your education, but the additional education you will need as you pursue your scholarly or professional life can be more effeciently performed outside of this institution and largely by your own efforts."

I would next like to contrast the master's degrees at the major Ph.D. institutions and the master's degrees that may be given by non-Ph.D. institutions. Here it seems to me there are some real opportunities for developments that are not being explored in the major institutions.

The large institutions—and the typical major Ph.D.-producing institution tends to be quite large indeed—are fractionated into little empires we call departments and disciplines, and I think there is a great deal to be said for the suggestion we ought to be producing biologists at some level and not just specialized types of biologists, for example.

I think that institutions that are not planning to move into the Ph.D. level should consider the use of the master's degree as a means of broadening the understanding of the field rather than duplicating what the major institutions tend to do, which is to try and bring the person at the master's level into the degree of specialized interest that they wish to push along at the Ph.D. level.

I am not sure how this idea sells. We have had conflicting reports within our own institutions, where some areas that have been at least sympathetic to this idea have taken some modest action. Our state college system, at least at the top levels, has recognized that there may be a good deal to be said for the more generalized type of master's degrees rather than trying to duplicate what the universities are doing.

But I think all of these institutions are up against the pressures for the use of the master's degree as an entry into professional practice. I suspect this will continue and expand.

Because there is perhaps an imbalance in the American system of what we might call the manning tables, and we need to produce a large number of reasonably well-trained—and in some cases very well-trained—liberal-education, general-education graduates with bachelor's degrees that companies and institutions of various kinds take in and develop into the kind of manpower that they need. Such persons have the basic education about value systems, understanding of systems, and then the employers teach them their own special system.

At the master's level, one question is, What are the products going to do? It is obvious from the figures that have been quoted, and can be reinforced by looking at any output of master's versus Ph.D.'s in the United States, that we are always going to have a much larger output of master's than Ph.D.'s and that most of these master's indeed either don't wish to go on to the Ph.D or can't go on to the Ph.D.

What is their entry? This question suggests the reason, I think, that the master's degree is becoming skewed in the direction of what might be called manning tables, manpower needs, local demands for particular kinds of qualified personnel.

What concerns me is that not enough institutions are worrying about the persons who just want to know more about, say, Latin American history, without regard to whether or not they are preparing for a particular teaching job or for any job in that special field.

It seems to me that we have overemphasized—and this is partly the economists' fault because we like to measure things that we can measure—the economic incentives, not only for baccalaureate education, but for advanced education. And I think this is particularly true at the master's level.

The master's degrees are becoming too much oriented toward jobs and not enough oriented toward adding some additional understanding of the fields for students who are interested because the subject matter is intellectually stimulating and they can afford to pursue this interest.

These may be relatively simple ideas, but I would like to defend simple ideas by a story. An economist friend of mine said that most of the economic tools that the best economists in the country apply to the solution of many national or state or local problems are not the main subject matter of our most advanced graduate courses. Most of the tools we use are taught to sophomores, but they don't believe them. And not until they have been through two or three teachings of these basic principles, basic ideas, basic concepts, at the intermediate level, at the first year graduate level, and sometimes not even until they are brought up to their preliminary level do they really believe that these are working tools.

One suggestion concerning the master's program is then that perhaps it should not try to teach more and more complicated, esoteric, advanced work in the field, but rather that by emphasizing basic understanding and appropriate interrelationships with other disciplines the students will be convinced that there is something operationally useful in the field that they took on for study. I would argue this strongly for the social sciences. I am not so sure, since I am not a humanist, that I can argue the same case for the humanities, but I think humanists might agree.

I think there is a very real place for the master's degree; I think it can be all sorts of things, but I think there are some rather simple points of general agreement from which we may depart in practice, rather than starting off by just departing.

Jacob E. Cobb

THE MASTER'S AS PREPARATION FOR TEACHING IN SECONDARY SCHOOLS

If I took too literal an interpretation of my topic, I would eliminate, I think, the noting of a relatively large number of master's degrees based on programs for preparing various school services personnel, such as so-called reading specialists, school counselors, school psychometrists, and the like, and for preparing elementary and secondary school administrators, principals, supervisors, superintendents. These, perhaps, should have a little consideration, if for no other reason than that it was the requirement of a master's degree for certification for many of these positions, especially the administrative positions, that gave great impetus to the establishment of master's degree programs in many of the schools, the then state teachers colleges established in the late and middle 1920's and for several years thereafter.

Now, it is perfectly true that prior to this time established institutions had for a great many years been offering master's degree programs for these specific people. These programs leading to degrees, master's degrees, were of various sorts. Some were part of a school of education, for the most part composed of courses in education of a very specifically job-oriented nature; some, indeed most, dropped the foreign language requirement—courses in research and statistics were added; job-oriented courses or projects replaced the theses; and some others were pretty much traditional sorts of master's degree programs.

A second phenomenon of this development was that as the master's degree became, as it did in several states, either a necessity for a permanent or professional teaching certificate or a necessity for advancement, in many instances no restrictions were placed on the programs—the emphasis was on the degrees. Thus, in a good many states—and my own State of Indiana was a good example—between 1949 and 1963 an elementary or secondary schoolteacher needed to hold a master's degree in order to obtain a permanent teaching certificate. And a very large number of these teachers took their degrees in programs leading to school services and/or adminstrative certification. I am sure there was a time in the State of Indiana when we could almost have had a half-dozen to a dozen principals for every principal's job there was in the state in terms of certification and in terms of the master's degree program through which these people had gone.

Not only did the requirement for the master's degree for school services and administrative positions bring many teachers into such programs, but the certification requirements also brought many new institutions into the offering of master's degree programs. This was an extremely significant development in graduate programs at the master's degree level.

Most of the teachers colleges—many of which were later to shed the name "teachers" and become colleges and many, somewhat later, universities—between the late 1920's and into the 1940's began to offer master's degree programs for elementary and secondary teachers, school services personnel, and administrators. The significance of this development can be seen from another angle. If I may quote briefly from a report on a study by Sagen and Harcleroad, these developing state colleges and universities, more than three hundred of them, are projected to enroll one out of every three degree-credit students by 1975. Almost half of these institutions are found in metropolitan areas, and the metropolitan areas contain the prospective students. In 1966, 60 percent of all the baccalaureate graduates of these schools were certified as teachers. But the proportion of teacher-preparation students to non-teacher is on a steady decline, and as the teacher supply surpasses teacher demand, the proportion of teacher trainees likely will continue to decline. In 1966-67, nearly three out of every four of these sorts of institutions offered graduate programs, many at the terminal master's-degree level, and virtually all of them offered some programs to prepare personnel for elementary and secondary school teaching. Many, of course, beginning mostly about the mid-1950's offered programs leading to the Ph.D. and the Doctor of Education degrees. And a good many of these are not small schools—running 15-, 20-, 25-, and even 30,000 in enrollments.

One more quotation from these two men: "Continued formal education is virtually required for the person occupying a baccalaureate or post-baccalaureate entry level position. For this reason, continuing education at the post-baccalaureate level in the form of master's and post-master's degree programs is the most rapidly growing area of higher education.

While discussions of graduate education have emphasized the production of Ph.D.'s, the data show that production of master's degrees increased at a faster rate from 1954 to 1966 than Ph.D.'s—127 percent as against 113 percent—and that the developing study colleges and universities increased their share of master's degrees to 29 percent." This is not a big percent. It means that the bulk of the master's degrees have been and continue to be granted by those schools that also grant most of the Ph.D.'s.

Discussions of the two previous gentlemen have indicated, I think, something of the background reasoning as to why this is true.

Now, let me try to put these two approaches together. As school consolidation and administrative reorganization have taken place and as supply has begun to catch up with demand, personnel needs have changed. Now there is a need for a kindergarten teacher, a teacher of American history, a teacher of European history, a teacher of matematics, and so on; in other words, a need for a specialist in a specific area.

In addition, many school corporations now have higher salary scales for teachers who have master's degrees "in their teaching fields." Thus, many secondary schoolteachers now are earning master's degrees in English and political science and psychology and the like, completely bypassing courses in education; good or bad, depending on how you happen to look at it.

If one were to judge from the literature, a considerable amount of thought and even some experimentation has been devoted to the idea that programs for the preparation of teachers might well be five-year programs. Some writers see the professional component being spaced throughout the five years. Others see it as constituting the fifth year. Some see all five years as undergraduate, or with the fifth year as graduate in the main but not leading to an advanced degree; others with the fifth year culminating in the master's degree. They have also been seen mainly as constituting the preparation needed in order to receive initial certification to teach. But at the present time, the typical academic requirement for initial certification to teach is the bachelor's degree. In many states this first certificate is provisional or temporary in nature and is periodically renewable or made permanent only on evidence of a specified number of hours of graduate study at an accredited institution. In some states the requirement is already specifically the master's degree; in some states, the master's degree or its equivalent, the equivalent often being thirty semester hours of graduate study. Thus, for the teacher who continues to teach longer than three to five years, for the so-called professional teacher, there would seem to be the expectation that he will enroll in graduate study shortly after receiving his baccalaureate degree in either an organized degree program or an unorganized program of his own choosing. It is also true that many school systems now provide additional and, in many cases, considerable salary increments for the completion of an additional thirty semester hours of graduate work. This may lead to a considerable amount of shopping around for courses offered at particular times or by particular professors or in particular places, regardless of whether or not the courses fit the needs of the teachers. If the master's degree is to be required of all people who teach more than the specified number of years—and I repeat, this is presently true in some states—some very serious questions relating to the integration of undergraduate and graduate programs are raised.

Of no little consequence is the question of admission to an accredited graduate school. Many graduate schools have academic admission standards for graduation from the undergraduate college. If this is the minimal graduation requirement for students on the undergraduate teacher education program, no problem exists. In many schools, however, the prospective teacher can be graduated from and certified on the basis of the minimal 2.0 or "C" usually required by the general college or university regulations. In many schools a student is admitted to or continued in the teacher education program on an even lower indication of academic achievement, and here problems begin to occur immediately. Are teachers certified to teach some years and then denied certification because they cannot be admitted to a graduate program leading to a master's degree? Are graduate schools to be expected to admit teachers simply because they're teachers and water down the graduate program so that most of them receive the master's degree? Are the graduate schools expected to admit them simply because they are teachers again, maintain the graduate academic standards, and drop many of them after six to twelve hours when they do not maintain the required grade index? Is the recommendation of the principal or superintendent to the effect that "Mr. Smith is one of the best teachers in our entire school system. Everybody likes him" to substitute for academic adequacy in a graduate school?

Simple as some of these questions seem to be, they are not so in practice. There are perhaps just as many compelling forces operating in and on the graduate school as there are operating on the teacher and in the school system. It does, however, seem to be grossly unfair to the teacher and wasteful of the time and energy of many people to certify a teacher for a specified number of years with the virtually certain knowledge that he cannot teach beyond that time.

It seems also that the awarding of a master's degree to a person just because he is a teacher who must have this if he continues to teach is just as unfair to the graduate school and to the students he will be expected to teach.

Maybe the one possible move toward the integration of these multihorn dilemmas is to approach the admission problem at the undergraduate level rather than at the graduate level. If the master's degree is to be a requirement for the certificate to teach, to be renewed, or to be made permanent, perhaps the academic level for admission to the teacher education program should be well above the institutional minimum. Perhaps, also, the academic level for admission to the student teaching program and for graduation should be well above the institutional minimum.

A second area of concern, if the master's degree is to be required of all teachers, is that of curricular integration. To what extent should the master's degree curriculum be an extension in depth and specialization of a secondary schoolteacher's undergraduate major and minor? To what extent should the master's degree program of the elementary teacher broaden and deepen his experiences in the subject areas he must teach? To what extent should the principal or the superintendent or the guidance counselor explore areas not directly concerned with budgets and basketball and how a particular student can get into a particular college?

I recognize that a great many very able people have worked over a long period of time to assess and to recommend innovations in the graduate preparation of teachers for elementary and secondary schools. I know that some change has occurred in some places. But it appears to me that in many instances innovation has merely meant more of the same, and the teachers are increasingly moving into more traditional departmental master's degree programs, particularly as job opportunity decreases and as school corporations offer a higher salary increment for holders of these degrees. Now, again, I place no value judgment here, I simply say it seems to me this is true.

As an approach to assessment, perhaps since we no longer have to worry about having a reasonably warm body in a classromm and since we know a great deal more than ever before about how people learn and since there is so much to learn that the judgment as to what to teach becomes increasingly important, perhaps we need to do it all over again. The international chess champion, for example, said, when asked to explain both the secret of his success and the reason why it took him so long to make his moves, "I start at the end and I take it play by play back to the first move." Maybe it's time to look again at the teacher and the job and work back from there in building a master's degree program that is relevant.

Many a secondary schoolteacher today is labeled a professional teacher or a master teacher for the one reason only that he has earned the master's degree. Do 30 or 32 or 36 semester hours of course work and examination and thesis in mathematics make him a professional or a master teacher or, in the language of the layman, a better mathematics teacher? Do 30 or 32 or 36 semester hours of course work and examination and thesis in professional education make him a professional or master or better teacher? Is there a mix of these two that will do the job better than either one by itself? Are master's degree programs actually intended to produce master teachers?

I think one of the silliest statements I have ever heard, and I have heard it many times—and I wish I could utter it in the way I have heard it, but I simply can't get that much piousness in my voice—is, "I don't teach subject matter, I teach children." Have you ever heard anything sillier than that? Why, of course, they teach children. We have other experts to teach the animals. The teachers teach children. But what do they teach them? Can teachers teach children children? Teachers must teach children something, don't you agree?

The only conclusion to which I can come is that it should be accepted as a fact that the master's degree is part and parcel of the preparation of teachers and is likely to continue so to be.

If this assumption is correct, then it would appear that continued major attention needs to be given to making this master's degree the dynamic part of the teacher preparation process that it can be, not merely the satisfying of certain professional or academic requirements.

I have asked a lot of question. I am sorry that I do not have the right answers for all of them. But I do not believe that reassessment can come by picking away at the process or the product. Such an approach may well, when all the little things are put together, bring about unanticipated and sometimes extremely harmful results.

Arliss L. Roaden

THE MASTER'S AS PREPARATION FOR TEACHING IN COLLEGES

Dean J. P. Elder observed more than ten years ago that the master's degree is a bit like a streetwalker—all things to all men (and at different prices).[1] That analogy is even clearer today, with some graduate deans publicly denouncing the degree but privately frequenting it. Let me put that analogy to bed by noting that the degree is being awarded at an accelerated tempo, and there is no indication of "master's abatement."

"The Master's Degree as Preparation for College Teachers," is a revisit of the topic which was dealt with most ably by Dean Elder more than a decade ago. Dean Elder was worried about meeting a projected demand for college teachers of around 450,000 by 1970 with an estimated production of 135,000 to 235,000 Ph.D.'s during the ten-year period. He recommended a year and one-half master's program in which the candidate would, when appropriate, (1) read one foreign language, (2) write respectable English, (3) concentrate on his subject and on methods of research during the first year of graduate study, and (4) in the second year, take another seminar, do some supervised teaching, and write a master's essay. Dean Elder concluded with the question of, "Who will buy the product if we do turn out a goodly number of well-trained masters? Will college presidents hire them in preference to those who possess the meretricious luster of an inferior doctorate?"[2]

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[1] J. P. Elder, "Reviving the Master's Degree for the Prospective College Teacher," *Journal of Higher Education*, Vol. XXX, No. 3, March, 1959, pp. 133-136.

In this presentation, I shall state what *is* the case regarding master's degree holders engaged in college teaching and attempt to deal with what *ought to be* the case.

Production of Master's Degrees

During the past decade, we have increased our production of master's degrees by more than 250 percent (from 74,497 in 1959-60 to 190,400 est. in 1969-70). Although the projected rate of increase for the next decade is not as great as the last decade, the number increase will likely be another 100,000 at least (est. for 1977-78 is 273,700).[3]

This rate of increase in the production of master's degrees has been astounding, and projections for the future—whether one accepts the conservative projection of an increase of 100,000 or a more recent projection of a 150,000 to 200,000 increase—are not modest.[4]

My review of the literature suggests that there has been a long-standing worry about uniformity of quality and the usefulness of master's degrees; however, there clearly has been no moratorium for study.

College Teachers with Master's Degrees

There are many forces that account for the increase in production of master's degrees, but a significant force has been the need for college teachers. The estimated number of instructional staff members (FTE) in 1969-70 was 362,000, an increase from 200,850 in 1959-60 (the total full and part time instructional staff (not FTE) was estimated at 509,000 in 1969-70, an increase from 281,506 ten years ago).[5] Dean Elder's predictions that a significant proportion of college teachers in 1970 will not hold the doctorate has been substantiated. In 1966, the proportion of college teachers whose highest degree was the master's was as follows: all four-year institutions, 39 percent; all two-year institutions, 73 percent; all universities, 28 percent. Proportions holding doctorates were: four-year institutions, 47 percent; two-year institutions, 6 percent; and universities, 54 percent. The proportion of *new* college teachers employed whose highest degree was the master's has been approximately 56 to 60 percent of the total employed each year for the past decade. Approximately 40 percent held only the master's and 20 percent held the master's plus at least one year, but less than the doctorate. The percentage of new faculty holding the doctorate has ranged from 25.8 in 1960-61 to 28.5 in 1966-67.[6]

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[2] *Ibid.*

[3] American Council of Education, *A Fact Book on Higher Education*, 3rd Issue, 1969, p. 9192.

[4] The ACE projection of 190,300 for 1969-70 seems low; Lewis B. Mayhew (*Graduate and Professional Education, 1970*, McGraw-Hill, 1970) reported 188,600 master's degrees were awarded in 1968-69. Further, he estimates a production of 350,000 to 400,000 in 1980 if colleges and universities follow through with their plans for graduate program development.

[5] American Council on Education, *op. cit.*, p. 9132.

What of the Future?

I have pointed out that graduate schools are producing master's degrees in abundance; further, those holding master's degrees constitute the primary manpower pool for college teachers (with 56 to 60 percent of new college teachers coming from this source). Although the data must be used guardedly, it appears that 8 to 10 percent of the annual production of master's graduates enter college teaching.[7] What of the future? Will there continue to be an accelerated production of masters? The answer seems, unquestionably, to be Yes. Will the trend of employing holders of master's degrees for college teaching continue? Or, will the publicized oversupply of Ph.D.'s fill those jobs? Or will holders of new degrees (e.g., D.A., M.Ph., M.A.C.T., and C.Ph.) fill the jobs? The answer here is not as clear; although, I predict little change from trends over the past decade. There seems to be an assumption (unwarranted, I think) that employers of college teachers prefer a faculty of Ph.D.'s if only they were available. Suggestions for reform of graduate programs to prepare college teachers frequently are premised on a shortage of Ph.D.'s. The implicit assumption seems to be that the *best* preparation for college teachers is the Ph.D., and all vacancies would be filled by Ph.D.'s if only there were enough to meet the demands. For example, Dean Elder predicted that the universities will, "gobble up—doubtless in a fairly cutthroat competition—the Ph.D.'s from the graduate schools of arts and sciences, or at least most of the good Ph.D.'s" "What, then," he asked, "is left for the faculty of the small, liberal arts college, which in many ways is the hard backbone of our humane education...?"[8] The facts seem to indicate that four-year liberal arts colleges have "held their own" fairly well with the universities. The percentage of faculty members in public and private four-year colleges holding the doctorate in 1954 was 37; in 1963, it was 51; and in 1966, it was 47. For the public and private universities, the percentage of doctorates for 1954-55 was 40; for 1962-63, it was 45; and in 1966, it was 54.[9] If universities hold a distinct advantage over four-year institutions in attracting Ph.D.'s, the advantage has been exercised only modestly. One could question whether or not those charged with faculty employment at either the universities or the four-year institutions were really interested in significant increases in the proportion of Ph.D. holders. A matter of very practical importance has been the astronomical enrollment increases, especially in the universities, which have introduced severe financial burdens. This factor alone could have precluded universities from "gobbling up" all of the available Ph.D.'s and, thus, influenced their employing large numbers of teaching assistants, lecturers, and other non-Ph.D. holders.

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[6] *Ibid*, pp. 9134-9138

[7] There is no indication of the number of master's graduates who enter college teaching directly. However, new college teachers with the master's or master's plus one year that are employed each year constitute 8 to 10 percent of the master's graduates of the preceding year.

[8] Elder, *op. cit.*, p. 134

Apart from the fiscal considerations, however, are hunches that the institutions may not be convinced that Ph.D.'s are the best-trained prospects for college teaching. Proportions of Ph.D.'s on faculties may have been determined largely by accreditation standards and aspirations of developing institutions to begin graduate programs.

Today, these questions are more important as they relate to two-year institutions since the two-year institutions constitute the most promising market for newly trained faculty members.

Teachers for Community and Technical Colleges

In the 1965 National Education Association study of college teacher supply and demand, the authors reported that:

> As might be expected, the typical junior college teacher has not progressed as far in his graduate studies as has his counterpart in the typical university or college...this report contains clear evidence that the universities and colleges are engaged in a struggle, in many instances unsuccessful, to maintain the quality of scholarship of their teaching staffs. The year-by-year record since 1953-54 shows that a great many degree-granting institutions have been forced to accept new teachers with less than the desired preparation. And, in the open competitive manpower market, the junior colleges have been similarly limited.[10]

The limited factual data that we have don't bear out the suggestions of cutthroat competition for Ph.D. graduates. The supply of Ph.D.'s has been such that claims of scarcity and competitiveness may have overshadowed a reluctance to seek Ph.D.'s for faculty positions in the two-year institutions.

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[9] American Council on Education *op. cit.* p. 9134-9136.

[10] National Education Association, *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges*, 1963-64 and 1964-65, p. 42.

Community and technical colleges because of their phenomenal growth have emerged to the forefront of our attention as consumers of master's graduates. I've reported that in 1966, 73 percent of the faculty of two-year institutions held the master's as their highest degree. Only 6 percent held the doctorate, and 20 percent held the bachelor's and lower; and another 1 percent held a professional degree. The percentage of new faculty members holding the doctorate has varied very little from the level of 6.2 in 1957-58. The percents of new teachers having completed at least one year beyond the master's degree were: 22.1 in 1957-58; 1962-63; 19.0 in 1963-64; and 20.7 in 1964-65. The percents of new teachers holding the master's degree (without a year beyond) were 43.6; 45.8; 47.8; 48.5; 53.6; 51.5; 49.6; and 51.3. The percents of new teachers with bachelor's degree or less decreased at about the same rate as the increase of teachers with the master's degree (28.1 in 1957-58 to 21.8 in 1964-65).[11]

Certainly, the phenomenal growth of two-year colleges deserves our attention. The Carnegie Commission reported that by 1960, more than 600,000 students were enrolled in two-year institutions; and by 1969, their numbers had grown to almost 2 million—nearly 30 percent of all undergraduates and 25 percent of all students in higher education. The number of such institutions is now over 1,000. Enrollment projections for 1980 are 3.1 to 4.4 million.[12] Staffing these two-year colleges is a tall order for graduate schools in the years ahead. Where do the teachers come from for these institutions? During the period 1957-58 through 1964-65, about 30 percent of the teachers came directly from high school classrooms. Next in frequency as a source of supply was the graduate school (20.1 in 1957-58 and 23.7 in 1964-65). Approximately 11 percent have come from business occupations.[13]

My analyses of these and other data related to two-year community and technical colleges lead me to some cautious generalizations for the future. My substantiation of the generalizations is based largely on historical review. Beyond the realm of history, however, are what seem to me to be some valid substantiations in economic theory and organizational theory.

1. The preparation of two-year college teachers as measured by

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[11] *Ibid.*

[12] The Carnegie Commission on Higher Education, *The Open-Door Colleges*, McGraw-Hill, June, 1970.

[13] NEA *op. cit.*, pp. 43-44.

degrees held is unlikely to change perceptibly during the next eight to ten years. There is little reason to think that Ph.D.'s will be employed in proportions substantially greater than the current level of 6 to 7 percent. A survey of California administrators of two-year institutions substantiated that these administrators don't seek Ph.D.'s for junior college teaching.[14] Further, whatever impact the Doctor of Arts degree may have (and I think there will be some) is several years ahead.

2. The sources of new faculty for two-year colleges will probably not vary appreciably. Experienced teachers will be recruited from the ranks of high school teachers, with those coming directly from master's degree programs in graduate schools at about the same rate as in the past; and technical programs will draw a significant portion of faculty members from business and industry. There may be some increase in the number of university and four-year college teachers who will move to two-year institutions because mobility among universities and four-year colleges is becoming more difficult and because of a renewed awareness of public service inherent in community and technical-college teaching.

3. Although proportions of two-year faculty members will not likely change in terms of degree levels and supply sources, quantitative needs will be severe. Also, the qualitative dimension is a matter for our immediate attention. Again, I quote from Dean Elder's earlier comments on this matter:

> The truth is that either institutions of liberal arts will supply the needed teachers, the Masters of Arts (who in the past in our Country were such stalwart supports), or else professional schools of education will hungrily jump in, with the same celerity that enabled them to found and staff normal schools in order to supply the late nineteenth century's need for elementary and secondary school teachers (when, be it remembered, the liberal arts colleges, in an indifferent snobbism, abdicated this venerable privilege and duty).[15]

It appears that some 30 percent, at least, of the faculty of two-year institutions are coming from programs in professional education. However, I find no evidence of overpowering "hunger" or "celerity" on their part. Professional schools of education more than have their hands full with problems of urban elementary and secondary schools.

4. Finally, Dean Elder's ten-year-old recommendation of a master's

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[14] Part II, "The Doctorate of Arts Degree," from *Approaches to Preparing Prospective College Teachers*. A Staff Report Presented to the Coordinating Council for Higher Education. Sacramento, California, December, 1968, 68-20 (mimeographed).

[15] Elder, *op. cit.*.

degree program for preparing college teachers still makes a lot of sense to me. The year and one-half program, heavy in subject matter and culminating with a supervised intership, is sound. Further, I think that some formal ties with professional schools of education within our institutions can be profitable. There are new and exciting developments in such areas as learning, micro-teaching, simulation, non-verbal communication, and teacher-pupil interaction. In my judgment, the time is past for us to lay aside such recommendations as the one expressed by the 1957 AGS Committee on Policies in Graduate Education that a course directly concerned with teaching *should be taught only by members of a student's department.*[16] Alternatives to ties with professional schools of education are the employment of teaching specialists by the basic departments (this has been done in more than a dozen departments in my university), or the establishment of university-wide learning resource centers.

Let me reiterate. I think the D.A. degree will make a difference, but the impact is several years away. The specially tailored master's degree is something that can be done now. (I acknowledge that some institutions have developed programs along these lines.)

Concluding Generalizations

I offer two very general concluding observations regarding the topic of preparing college teachers. First, studies in career development suggest that career decisions are made much earlier than we once thought. Perhaps we should study the job that needs to be done in college teaching and recruit from lower-division undergraduate ranks students who possess appropriate aptitude, academic ability, and motivations for college teaching. We, then, have the latitude of reshaping aspects of the undergraduate program as well as the first year or two of graduate work. This proposal, suggested earlier by Carmichael, may be an exciting alternative to tinkering with the master's degree program and worrying about the marketability of our products. Simply stated, we should prepare college teachers on purpose, not accidentally.[17]

My second, and I assure you my final, observation goes beyond my charge for this program. The public spotlight is on the improvement of undergraduate teaching. I am, therfore, optimistic that we will be properly stimulated and motivated to do the job—though we may be a bit awkward and engage in some trial-and-error processes. Let us define the job that must be done and move ahead with it. I'm worried, however, about another fundamental mission of graduate education that is not in the public eye currently—the generation of new knowledge. We will fumble badly in all of our training and action programs in the years ahead unless we exert our strength toward extending and improving bases of knowledge while at the same time we are improving our training and action programs.

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[16] Association of Graduate Schools, Committee on Policies in Graduate Education, 1957.

[17] Another area not covered in this paper is in-service education of college teachers. Graduate Schools have been so preoccupied with the pre-service education of college teachers, there has been little time devoted to updating, extending, and widening the scope of teachers on the job. Since graduate schools are only minimally equipped (if at all) to prepare college teachers in technical fields, they

QUESTIONS AND ANSWERS

P. J. Alscamp, Roosevelt University: The question is directed to Arliss Roaden, whom I know. Arliss, as you know, nobody appreciates hard data more than I do, but some of your statistics remind me of the statistician who drowned in the river whose average depth was only two feet.

I particularly want to ask about your predictions concerning the future of master's degree candidates *vis-à-vis* Ph.D. holders.

I think that what you said concerning the percentage of master's and Ph.D. teacher faculty at large universities is probably correct. That is to say, I would predict, as you have done, a roughly constant level, speaking in terms of a ratio between M.A. and Ph.D. people at universities in excess of 20,000 enrollment or perhaps even 15,000. But I think that in the case of private universities and colleges ranging in enrollment between five and twelve or thirteen thousand who are not first rank in national reputation—I am leaving out the Harvards and the Yales—that the case may be quite different.

I know, for example, as Dean of Faculties at Roosevelt, I will be exerting every effort to take advantage of the present market situation in those areas where Ph.D. holders are available, and I have every reason to expect that this will result, if we are successful, in a decline in the percentage of master's candidates on our faculties and an increase in the Ph.D.'s.

I think that this could be a very significant factor on the national level with regard to the distribution of those relative degrees.

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may join with business and industry in this extensive enterprise especially for in-service teachers. The next decade may be typified by graduate schools involving themselves extensively in the improvement of college teachers who may have minimal preparation in their disciplines and who may not be equipped to cope with problems related to the urban setting of most community and technical colleges.

A. L. Roaden: Yes, Dr. Olscamp. I said earlier that data in higher education is very shaky, to say the least. There are data available that separate out the percentage of faculty members who hold the doctorate and who hold the master's, *et cetera*. There are data available that break out by public institutions and by private institutions of varying sizes as well as by universities, colleges, and two-year institutions. But the difference across the board between private and public institutions is just a matter of a few percentage points.

I am sure if one applied, as you suggested, some qualitative scale to that, you would find great variations. But putting the data together for all private universities and data together for all public universities, the difference really varies by just a few percentage points along that way.

You predicted that there would indeed be an accelerated rate of employment of Ph.D.'s. I certainly don't want to suggest that such ought not to be the case, nor do I want to suggest that I wish it weren't the case. Quite the contrary is true. I just don't find any data, either historically or from any other disciplines or theories, that would suggest that we are going to do a great turnaround in higher education and suddenly move from that 6 or 7 percent in the natural sciences up to 40 percent. That is wishful thinking, I think.

J. F. Porter, the University of Alabama in Huntsville: I think in reassessing the role of the master's degree, we might consider another point of view. This is in an operational sense as we are progressing down the path of the development of higher education. To what degree is the master's degree assuming the role operation? We had the bachelor's degree in days gone by, particularly in the sense that it was at that level that the individual attained a marketable skill rather than becoming a generalist?

The master's degree in many of the professions is now or will become a professional degree which gives you marketable skills. Health care professions is such an area.

Third Plenary Session: Reassessment of the Ph.D.

Thursday, December 3, 9:00 a.m.

PRESIDING: Stephen H. Spurr, *Chairman-Elect, Council of Graduate Schools*

Daniel Alpert, *University of Illinois*
W. Donald Cooke, *Cornell University*
Michael J. Brennan, *Brown University*
David R. Deener, *Tulane University*

Daniel Alpert

THE RELEVANCE OF RESIDENCE REQUIREMENTS

In asking me to speak on this topic, Boyd Page called to my attention the rapid change in residence and other requirements at the undergraduate level and the growing pressures at the graduate level to reduce residence requirments, particularly for the master's degree. Although I am not aware of serious challenges to the concept of residence requirements at the Ph.D. level, I agreed to review the implications of residence requirements for doctoral candidates in a changing world.

My first response to this issue is that at the doctoral level the question facing students and faculty alike is not the *minimum* residence for the Ph.D. but rather the *maximum* residence that should be permitted candidates in a given degree program. Since our minimum requirements are typically so much less than the time actually required to get the degree, the requirement itself often becomes of small concern to the average student. Furthermore, such considerations as job availability rather than educational advantage may decide the actual duration of the student's stay on campus.

But before we decide whether the student's stay on campus should be long, short, or dispensed with entirely, we would do well to explore the interrelations between residence, graduate education, and our changing environment.

What are the implications of current changes in residence and other requirements at the undergraduate level? As educators know, the flexibility in course selection and grading which many undergraduate institutions are introducing will soon make the grade-point average meaningless as index of student performance. Some colleges give full credit for a semester or a year creatively spent outside the formal educational establishment. Other colleges, anticipating the recent recommendation of the Carnegie Commission, are considering a reduction of the requirement for the baccalaureate degree from four to three years.

The current revision of undergraduate education, led by some of our liberal arts colleges, is motivated in part by the growing financial squeeze. This rethinking of objectives and priorities will soon change the entire concept of the baccalaureate program. At the same time, the growth of community colleges suggests that fewer students will spend all of their undergraduate careers at a single institution. It may be only a question of time until the baccalaureate degree will no longer require continuous residence at a given campus.

Concurrently with changes in undergraduate education, demands for changes in residence requirements are increasing at the master's level. Here the picture is confused by the wide variety of requirements and expectations that characterize this degree. Furthermore, the student population includes both young recent college graduates and mature practicing professionals interested in updating their skills or improving their certification. It is in this context that pressure is growing to permit students who hold down a full-time job off campus to take courses and be certified.

At the same time that the structure of undergraduate and master's programs are in a state of overhaul and rethinking, I am persuaded that education is on the verge of a technological revolution that will have an impact comparable to the introduction of the printing press. The capacity of that technology, four centuries old, to store and transfer knowledge is breaking down seriously under the vast increase of available information. A new technology in the form of computer-based education systems may be the answer to getting this new knowledge off paper and into minds. The PLATO program in computer-based education at the University of Illinois has already demonstrated the economic viability and the remarkable instructional productivity of such systems. PLATO has been used to teach subjects from elementary reading to advanced chemistry, from pharmacology to political science, and from computer programming to population genetics. Even in the prototype PLATO IV system, we envisage thousands of consoles in an education network distributed throughout Illinois and even wider areas. There is every reason to believe that by the mid 70's a statewide PLATO network will begin to break down the lockstep of the formal educational process both in time and in space. With the PLATO system, students at any community college in Illinois could take certain basic courses identical to those being given to our freshmen and sophomores at the University of Illinois. The possibility of such a program is already being demonstrated at one such community college.

How shall we deal with education and certification at a distance? In my opinion, we shall have to consider this question in straightforward pragmatic terms. If we grant a master's degree to a student in residence for successfully completing a string of courses, I do not see why we should not grant the master's degree if those courses are successfully completed by other means, in or out of the classroom. There is every reason to believe that in many fields the new technologies will provide better and more highly individualized instruction than will be available in our classrooms and lecture halls.

If interaction between professor and student is what we believe to be essential for a master's candidate, we must ask how to achieve a high quality of such interaction. Does it make sense to ask a forty-five-year-old engineer to leave his job and home for a semester or a year to take part in our current classroom exercises? If certification were required for the position of graduate dean—perish the thought—how would we define residence requirements?

With the aid of the new technology, I believe that within a decade the university as a center for teaching will be capable of reaching out geographically over hundreds of miles. Many of our teaching assistants will then become research assistants, reviewing the effectiveness of our teaching efforts. Furthermore, I believe that the university as a center for teaching will not place restrictions on the age or educational level of its clients. We may have to design some new degrees then. I leave it to your imagination to design some reasonable residence requirements.

How do these developments relate to residence requirements for the Ph.D.? Obviously the changes in baccalaureate programs will present us with admissions problems. Without the grade-point average to characterize incoming graduates, how will we identify a good student? This problem is far from insuperable. We already depend to a great degree on the written or oral evaluation of students. But how about the reduction of the baccalaureate program from four to three years? Does that change imply a shorter or longer interval for achieving the Ph.D.? We already know that students from liberal arts colleges often require an extra year for the Ph.D. We can hope that the change in bachelor's degree requirements will for our brightest students shorten the time required for a doctoral degree from eight to six years.

But will we dispense with or significantly change the residence requirements for the Ph.D.? It seems to me that we cannot and should not be without our graduate students in residence and hence should continue significant residence requirements. To answer this question intelligently, however, we will have to re-examine the substantive reasons for our residence requirements.

It has often appeared strange to me, and often destructive, that the requirements as well as the rationale for graduate education are usually stated in terms that imply that graduate study is of value only or primarily to the student. If there is a single theme that I would like to underline in the course of this paper, it is that the doctoral student brings to the campus as much as he takes away. Indeed, without doctoral candidates, an institution might be a center of teaching, but it is far less likely to be a center of advanced learning. The role of professors is to set standards, post problems, and establish the cultural style of graduate activities. But although graduate students learn quite a bit from their professors, they typically learn much more from their students as they teach them. So quite apart from their function, indispensible in many universities, to provide a cheap source of teachers for undergraduates and research assistants for professors, graduate students play a vital role at the center of the university's intellectual life. For this reason we had better have them in residence even if we have to establish requirements to keep them. At the same time, we must continue to reappraise the role of graduate students, particularly doctoral candidates, in the life of our institutions.

To clarify this role, it is useful to consider how doctoral candidates fit into the major social functions of the university. It is commonly accepted that these functions are: (1) Creation of new knowledge, its integration into the existing body of knowledge, and the maintenance of intellectual standards. (2) Transmission of knowledge and technical skills to the new generation; the training of experts and professionals. (3) The socialization of late adolescents and young adults through the opportunity to select life-styles. (4) Application of knowledge to the solution of problems posed by society.

It is interesting to observe the changing role of the graduate student in each of these major functions.

In recent years the role of the Ph.D. student in the search for new knowledge has changed from master's apprentice to critic of values and priorities. This restless questioning may be least apparent in the physical sciences and engineering, which have become less popular than those fields that deal more directly with social problems. It is in the social sciences and the humanities that graduate student demands for a rescaling of priorities and for relevance to current issues are felt most strongly.

In the transfer of knowledge and skill to a new generation, the graduate student as teaching assistant has in the past played a subordinate role. Now, graduate students are demanding a level of participation in decision-making that is consonant with the important services they perform. To be of value to the student, however, the role of teaching assistant must be a creative part of his learning experience. If this role is formulated over the bargaining table rather than on the basis of educational considerations, the real usefulness of the teaching assistantship may soon be lost.

In the past, the social life of the undergraduate has borne little similarity to that of the graduate student. Today, however, the social life style of undergraduates closely resembles the independent yet interdependent life of graduate students; the fraternity-sorority life of earlier generations no longer dominates the scene. In the life styles of undergraduates, then, the graduate student, particularly the doctoral candidate, is a far more influential model than is the faculty member.

It is in regard to the application of knowledge to the solution of problems posed by society that student demands for relevance are most persistent. Fresh answers to these complex questions, however, cannot arise in a cloistered environment. Leadership in applied areas must be based on wide experience and must be able to operate outside traditional departmental units. Neither students nor society will allow the university to forget its obligation to prepare young people for new roles.

From the observations above it goes without saying that reforms in graduate education must go far beyond the re-evaluation of residence requirements. Yet in one sense, each of the discontinuities in the role of graduate students is related to the question of residence. One of the ideas which we as graduate faculty have tried to inculcate into our clients and sponsors both is that the university, particularly the department, is the center of a cultural environment. To achieve intellectual independence, the student must be part of that environment for a minimum period of time. Now I believe that this assertion is justifiable *only to the extent that the department, college, or university represents a true community*. Especially at a time when there may not be a job at the other end of the pipeline, our students must have had and must be aware of having had a worthwhile educational and human experience. In all too many cases, however, the student has lived in a parochial, fragmented community, whose life style violates the lofty academic ideals it professes.

There is no point to demanding residence in an environment that has embedded within it basic hostilities that generate a correspondingly compartmentalized view of the world. If the fragmented community is to be reunited, all departments must face up not only to their own problems but also to those of the university as a whole.

In each of the major areas of our university community—the natural sciences, social sciences, humanities, and professional schools—there is a need for re-examining our objectives, our culture, and our relationship to society and the student. At a time when civilization seems to be in greater need of highly educated men than ever before, we are suddenly faced with being the principal consumer of our own product. Even the physical sciences and life sciences find it difficult to place their new Ph.D.'s and to gain support from a suddenly unfriendly society. Scientists are going to have to find out what went wrong, and they will not discover the source of the trouble in the laboratory. In every field there is a need to set aside the shell game of academia, the game which rejects criticism from outside a given area of expertise and which therefore limits the concept of academic community.

If the objective of our educational system is to provide courses or to develop particular skills, I believe that keeping graduate students in residence is neither the most economical nor the most effective way to attain these goals. On the other hand, if the cultural environment is to be a major reason for having a residence campus, that environment must be conducive to individual growth and learning. In other words, I believe that the university can be a center of teaching and reach out to many thousands of students at remote locations. I do not believe that the university can be a center of advanced learning without having in residence both faculty and graduate students who share a community of intellectual interest. When we become a true community, we will have residence with or without the requirements. The graduate student will then have a chance to learn through actively participating in experience that enlarges perceptions and will not be merely the passive object of "teaching."

In this paper I have talked of doctoral candidates rather than candidates for the Ph.D. As for the Doctor of Arts or other new doctoral degrees, such degrees will become meaningful only when some of us on the faculty have changed our values, our objectives, and our way of life; not when we have changed a requirement or strung together a new curriculum. When we have made such changes, the D.A. will have attained a status similar to that of the Ph.D., and my remarks will similarly apply.

The world of 1970 was virtually unpredictable in 1965 and is totally at odds with our rather secure position at that time. It is my view that the world of 1975 will be as different from today as is the comfortable world of 1965. Such change brings with it a sense of challenge and opportunity as well as concern.

W. Donald Cooke

RESEARCH COMPONENT – NATURAL SCIENCES

As some of you know, I have a tendency to be an iconoclast and Boyd Page, when he asked me to speak, probably had the feeling, "Well, Don Cooke will say something to make everybody mad," and I am afraid I am going to disappoint Boyd, because when I look at the research component of the natural sciences, I think my own evaluation is that we have no need for any fundamental changes. I would like to try to defend that particular point of view.

Obviously, being a natural scientist myself, and a chemist in particular, I may be accused of prejudice.

How is it that I can make such an odd evaluation in these days of turmoil and change, when so many things are happening and when re-evaluation is so prevalent? I think the latest piece of evidence comes from a new book by Ann Heiss called *The Challenge to the Graduate Schools.*

The book is based on a survey of some 3000 students in ten universities and some hundreds of faculty members. There is no question that the book in general, and the results of the study in particular, are a long litany of graduate student discontent.

However, when you look at the fine structure of the study, it turns out that the natural sciences stand out as a relatively bright spot, particularly when we are talking about the research component.

If my charge were broader than the research component of the Ph.D., I could find much to be iconoclastic about. I think there is a great deal that should be changed in graduate education and much that is wrong with the operation.

But let's look at how the students and faculty answered questions in the survey about the research component of the Ph.D. program, again limited to natural sciences.

As for the students, 85 percent felt that the research component was intellectually stimulating and 93 per cent felt that it contributed to their scientific development. These are pretty significant percentages, considering what graduate students are thinking these days.

Of course, there were some complaints of students in the natural sciences, but they were generally related to other things than the research component, such as conditions of their teaching assistantships, stipends, and other such topics. But the research component seemed to be accepted as satisfactory by almost all.

Eighty-eight percent of the faculty—again I am talking about those in the natural sciences—felt that the dissertation research should remain unchanged. In these days of turmoil and student-faculty polarization this is a remarkably unanimous consensus. One would have to be very careful in considering a major change in such a well accepted system.

Parenthetically, I might add for my chemistry colleagues a quote from Ann Heiss's book. After reviewing all the student questionnaires, she concludes: "From responses of the students, the doctoral program in chemistry is apparently the ideal approach."

One might ask why this is the case. And there are truly remarkable differences between the various areas when it comes to student evaluation of their dissertation research. As I mentioned, 93 percent of the students in the sciences replied that they thought the research contributed to their development. The equivalent percentage for students in English was 43 percent. That is a striking difference, and I would like to speculate on the reasons for it.

Is there a lesson here for the other areas? I think the fact that graduate work in the natural sciences seems to be more workable is a happy confluence of two basic conditions that apply, I am afraid, only to the natural sciences.

First, the beginning graduate student rarely has the scientific maturity to pick a significant research problem. He usually has an option of the sort of things that he would like to do, but it is the professor who chooses the problem. So the student needs the professor.

Secondly, in the natural sciences, the professor needs the student. He needs him to maintain his research effort, and his reputation depends to a large degree upon the student. So they both have substantial need for each other, and this happy marriage of roles and ambitions probably explains the relative lack of discontent of students in the natural sciences concerning their research. I would again like to emphasize that they have other complaints, not related to their research.

Of course, it could be argued that this is a poor way to train students, that all you are doing is using them as a pair of hands, and to a degree this is true. But there is another side to the coin. In any well-run academic program, students in the natural sciences gradually develop into independent investigators, and most scientists know that the student in the last year of his research program is almost completely on his own, with the professor playing a minor role. That is, of course, when we give him his degree.

We could, of course, change that system to allow students to pick their own problems as they do in other areas. One can give some idealized arguments for such a change. Let the student develop his own imagination and let him think about choosing a problem. The argument I have against such a proposal is that the problems would be trivial and the advancement of American science in the universities would come to a halt.

In the social sciences and humanities the situation between the professor and the student is very different. Students are expected to choose their own thesis problems. It is his responsibility, usually with some help from his professor. But what the student does in his own research, if published, is his work alone and has no effect on the professor's reputation except indirectly. The professor's name is rarely on the publication. I think most professors in social sciences and humanities look at their role in directing thesis research as a duty. Neither the student nor the professor is very dependent on the other.

Frequently, humanities students, after passing their admission to candidacy examination, leave campus and are totally independent of their professor.

The situation in mathematics and physical science theory is not unlike the humanities. Most students in mathematics contribute very little to a professor's research program. Students are just not capable of making much of a contribution to the professor's research and reputation.

I think that's why the natural sciences are different and I see no pressing need for radical change. There are, of course, problems. In looking at the modes of graduate education in chemistry and physics, for example, one finds two very different types of philosophy. It is evidenced by the fact that chemists will normally finish their degrees in something like four years of full-time study, where the physicist will get his Ph.D. in more like six years of full-time study.

What is the difference between the two programs? I think it has to do with traditions and what the physics professor expects in level of competence of his student compared to what the chemistry professor expects. I believe that chemistry sets its sights lower than physics. It is probably true that physics experimentation is more complex, equipment takes longer to build, and experiments are more difficult than in chemistry. But I think it is more a question of what the physics professors expect in the way of competence from their students and in all areas this is a purely arbitrary decision.

But there is another difference between graduate study in chemistry and physics. A relative large percentage of chemistry graduates take a year or two of post-doctoral study. Physicists generally do not follow this pattern for the obvious reason that they have spent a longer time in graduate study. I think the physicists might change to the chemistry system—arbitrarily decide on a lower level of competence and shorten graduate study to four years. I am not proposing any rigid time schedule since it is not applicable to science. Those who are truly interested in a research career would then take a year or two of post-doctoral study. I think this plan would be a better package than six years at one institution under one professor. It would also save time and money for those who are not interested in a university career.

The Ann Heiss survey indicated one complaint by students in the natural sciences that is worth discussing. They felt that their research programs were too narrow and placed limits on interdisciplinary study. Physics departments will allow their students to take mathematics; chemists will let their students take biochemistry, math, or physics. But rarely are the students encouraged—and often they are not allowed—to broaden out into the more applied areas.

I think that students should be trained as chemists, but they should be given the opportunity, through flexibility in programming, to take a few courses in applied areas. The broadening of the curriculum would allow the students to gain knowledge of the applied areas and after obtaining their Ph.D.'s to go into such things as ecology and water resources.

Lastly, let me mention two or three anachronisms from the Middle Ages that still persist in our institutions. The first, while not directly applicable to my charge, is the sanctity of the diploma.

I suppose that in all our institutions the Great Seal of the university is locked up in a vault, and there is considerable security on issuring of diplomas. I think that's an anachronism. I don't want to discontinue passing out diplomas, but we should recognize them for what they are, wall decorations, particularly for M.D.'s. Perhaps in the fifteenth century they meant something. You couldn't write to Bologna for a copy of a student's transcript, and he carried his diploma with him.

I think that same thing applies to our theses. The concept of the thesis probably goes back to the days before books were so readily available. I don't really see any need for a thesis as we know it. At Cornell a student wanted to put his fourteen publications between the usual black-covered thesis binding, and the General Committee said No. I think all he would have to do to satisfy me is to note that he had fourteen publications and that his professor agreed with him.

One might argue that if the thesis material were not to be published, the work would be lost. I would reply that, in these days, if something is not publishable, it is not worth reading. In fact, much that is published is not worth reading.

Lastly, the other anachronism that I think still persists in universities is the sanctity of the Ph.D. itself. At one time in the history of educational development it meant something, particularly the certification of unusual ability. Nowadays I don't believe it. I think any ambitious, hard working student who wants to get a Ph.D. can do so if he plans his choice of field and institution cleverly. But I don't suppose we are going to do away with that certification anachronism because, as the Wizard of Oz said, "You don't need a brain, you need a diploma."

Michael Brennan

RESEARCH COMPONENT – SOCIAL SCIENCES AND HUMANITIES

I note with a sense of familiarity that we are here today to reassess outselves. My bag is research in the humanities and social studies. In pondering what I might say, I found that I was repeating some venerable prophets. Knowing that few people enjoy stale news, I do believe, nonetheless, that a restatement of their prophesies is warranted. My own "original contribution to knowledge in the field" is an extension of the arguments to what I regard as the hinge of change in today's graduate school.

My postulate is a simple one. Both the social studies and humanities have imitated the sciences in two respects: methodology and degree of specialization. As the natural sciences developed over the past century, the contrast between so-called "scientific method" and other modes of thought was drawn to extreme. Of course no respectable scientist believes there is such a thing as *the* scientific method, and we should not allow my premise to be carried to the trashcan on that digression. Rather, the advance of hypotheses, theoretical model building, quantification, prediction, and empirical verification have demonstrated that such methods yield control over nature and the future.

Aside from applications in technology, the glory of science has been its reliance on objectivity and its insistence on empirical testing, which together dismantle bigotry or intolerance. But the extreme is born when philosophers and scientist propound the credo that scientific methods lead to knowledge while everything that cannot be formulated clearly in discursive form is merely an expression of feeling, an exuding of private value judgments. And the tragedy of the humanities began when many swallowed that assertion. Whether through self-images of inferiority or through pretensions to objectivity, representatives of the humanities have come to deny the legitimacy of vision, or values, or speculation even while they ignore the fact that these are used in any scientific lab. Scholarship then embarks upon a passion for counting, documentation, exactitude, analysis, and critical exchanges that border on the petulant.

A consequence too of the imitation of science is an addiction to specialization. Scientists have judged that specialization is imperative. Yet I would guess that the humanities are today more specialized than the sciences, perhaps because the nature of challenging scientific problems and the routes to their solution dictate that the trend toward more specialization be reversed. As imitators, the humanities lag. Overspecialization is a major contributor to a depressed condition in modern languages, history, philosophy, and some of the social sciences.

I have said these postulates are not new. In 1925 Alfred North Whitehead was warning us of the cultural danger awaiting us if we continued on our course of intellectual specialization. For years Gustave Arlt has chided the humanities for an unseemly imitation of the sciences. I will now argue that corrective measures on overspecialization are already underway. However, I will also argue that we have not yet faced up to the issue of methodology, and that this issue lies near the heart of reassessment.

Research interests, like other phenomena, are subject to evolution. Recognizing that we may have gone too far in specialization, recognizing too that our present cultural needs demand greater breadth of perspective, we spend much of our energy designing interdisciplinary programs of study and research. For we have discovered that solutions to the problems of the city, to environmental pollution, to poverty, to racism, and to institutional reform cannot be reached by reference to the traditional disciplines. Usurping the hat of an economist and relinquishing for a moment that of a dean, I see a parallel between the contributions of physics to the breakthroughs in biology and what might come from a joining of the relatively powerful analytical tools of economics and the insights of "soft" sociology. The upshot can be not only workable solutions to social problems but, from a purely intellectual view, the emergence of new, more comprehensive disciplines.

Theology links up with sociology, psychology with linguistics, philosophy with economics. I can imagine that departments of modern languages and classics and anthropology will evolve into departments or centers of modern civilizations, housing literary critics, historians, philosophers, and social scientists, all plying their trade to the products of that civilization.

But caution says it is advisable to pause and consider how we are going about this enterprise. Basically, we manipulate administrative structures to reach intellectual objectives. A year ago I sat through a CGS panel discussion and listened to distinctions drawn among interdisciplinary, crossdisciplinary, multidisciplinary, transdisciplinary, and pandisciplinary studies. Having created departments as convenient administrative units, and having identified these units with segments of knowledge called disciplines, and finding that each such discipline has developed its own methodology, we are now faced with the difficult problem of integrating diverse methodologies. Thus we find ourselves able to agree that knowledge is all of a piece, and yet we can remain intractable to disciplinary merger on methodological grounds.

It has been said that the disasters of mankind are moved by the narrowness of men with a good method. The man with a method good only for his dominant interest is potentially a pathological case with respect to his wider judgement and the coordination of his method with a more complete human experience. That the search for comprehensiveness is delayed by separatist methods goes only part of the way toward explaining the now tiresome charge of irrelevance levied against the humanities and social studies. Examination of these methods reveals a common commitment to the *culture* of science.

Since science is concerned only with what and how we know, the culture of science subjugates visionary experience. The culture of science cannot locate its values in mystic symbol or ritual. But man, in addition to knower, is dreamer and lover and mythmaker. Spread of a scientific culture to the humanistic disciplines tends to relegate visionary experience to a phenomenon to be studied by experts, tends to relegate visionary experience to the semi-eccentric world of the artist or the mystic. We have C. P. Snow to thank for the unfortunate "nation of two cultures." Rather, it would seem we are in desperate need of *one* culture in which the humanities and humanistically oriented social sciences define the context of science.

Human existence does not consist solely of accumulating knowledge. Man must live from day to day and seeks to love in a way that integrates his whole being in knowledge, intuition, joy, and fellowship. He has need to shape his knowledge, his passions, his insight, his hopes, exuberance and moral concerns into a scale of living. By defining the process of scholarship as the acquisition of knowledge through expertise, we diminish our own existence.

To expect a set of demonstrable propositions that specify how the whole of life might be in the product of research instead of something fragmented on which research is done may perhaps reflect the extent to which we take for granted the culture of science. I hesitate to proclaim a new mode of consciousness, so I settle for a more modest proposal. As in teaching, so in research: renewal does not prescribe new methods so much as a new spirit. I also hesitate to preach, so I offer only a forecast. I am willing to wager that upcoming generations, even without encouragement, will do just that: in a new spirit come to scholarship with no hesitance of incorporating speculation, vision, insight, and values into their publications; of challenging the myths of this era in terms of a more animalistic interpretation of man.

David R. Deener

WHITHER THE PH.D.?

Whether viewed as an imported commodity or as a domestic product, the Ph.D. degree in the United States boasts a most respectable vintage.

In fact, either the imported or domestic variety qualifies under Bureau of Customs standards as an antique, since it is now 153 years since Edward Everett received his Ph.D. from Göttingen, and 109 years since Yale awarded the first domestic Ph.D. in the United States.

That the Ph.D. found a hospitable climate in America is certainly understating the case. Yet in retrospect, the growth in doctoral education in the U.S. during the immediate four decades after Yale's first award could scarcely be called phenomenal. Even so—and this is a bit comforting— alarums were sounded and antidotes prescribed back in what to most of us seems almost a pre-history in the development of the Ph.D. To illustrate, in 1903 no less a personage than William James complained in print of the "Ph.D. Octopus"!

Following the turn of the century, the growth rate in the doctoral area did indeed become phenomenal. Graduate enrollments doubled with each decade from 1900 to 1940, and the growth rate became more phenomenal after World War II. The doctorate award rate, not merely graduate enrollment, will have tripled during the 1960's from about nine to ten thousand in 1960 to almost thirty thousand in the current year, and projections indicate that 1980 the annual award rate will be somewhere between sixty and seventy thousand.

In the present period of expansion, the alarums of yesteryear sound like fond lovers' complaints compared to the bombastic criticisms currently leveled at the Ph.D. Probably every facet of the Ph.D.—the dissertation requirement, the language requirement, the residence requirement, the entrance requirement, *ad infinitum*—has come under attack. In short, the 1960's have unleashed a complex of forces that could thoroughly reshape the Ph.D.

What I propose to do here is to indicate briefly the direction of this potential reshaping, as I see it, and then to place some emphasis on a few of the human forces, as distinct from the academic forces, that are pushing and resisting the reshaping of the Ph.D.

Let me first set forth the direction of reshaping, as I see it. In theological terms, the direction of reshaping is away from the criterion of works and in the direction of the criterion of faith, or in mundane terms, away from the standards of achievement and accomplishment and toward the standard of presumed potential. Further, these reshaping pressures are affecting all the major components of the Ph.D. program as it has been known in its classical form.

The Ph.D. has been most commonly defined as a research degree, the hallmark of which, the dissertation, is a contribution to knowledge. The dissertation, defined as an original contribution to knowledge, has distinguished the Ph.D. from all other advanced degrees.

But what is happening in the area of the dissertation? From a demonstrated original contribution to knowledge, which was the classical definition, there has been a tendency in many fields simply to make it a demonstration of ability to use research tools, without the necessity of showing any research accomplishment. And in some areas it is not even a demonstration of ability to use research tools, but rather mere awareness of what research skills are necessary to perform research if the student ever wanted to do it. This has happened most clearly in the master's area, where the master's with a thesis is rapidly being replaced by the master's degree without a thesis and perhaps a course in methodology along the line. I must also mention that in some disciplinary areas the dissertation topic is becoming phrased in a very hypothetical way, almost a hypothetical hypothesis rather than a subject or problem susceptible to empirical demonstration.

The changes in the language requirements are part of this movement away from demonstrated achievement to the ability to use skills and finally to mere awareness of what the skills are. In some institutions the two-language requirement has been substituted partly by statistics and in other institutions partly by a couple of courses in a cognate field.

In the area of course work, under the stress of the last couple of years, the pressure has been to move from graded course work to pass-fail. Again, the students are reacting against any kind of a demonstration of achievement in pressing to go from graded work to pass-fail. I have no doubt that in some institutions mere registration for course work will become sufficient without even a pass-fail.

In the entrance requirement area the "B" average level, which was printed and probably still is printed in most catalogues, has just about gone by the board. The Graduate Record Exams are used when a department needs to exclude somebody; they are disregarded when a department needs to take somebody in. And in many institutions open admissions has become the policy for entrance to graduate school. All of which, as I see it, is away from the criterion of achievement to something else—call it presumed potential or simply call it equality.

Now then, what are these human forces, as distinct from the academic forces, that appear to be shaping or attempting to reshape—and resisting the reshaping—of the Ph.D.? I would like to talk about these forces in terms of the psychological rewards or motivations important to human beings, particularly status and prestige, and of the material rewards or motivations or the desire of human beings to get more of the economic goodies of this particular political system.

There are three groups that are going to be very important in this reshaping. First of all, there are those who already have the Ph.D. They man the university and college faculties. They man many of the positions in state boards, many of the positions in government agencies dealing with higher education. They compose the "Ph.D.—dom". They have acquired high status; they have acquired a considerable portion of the economic goods of this society; and they "ain't about to give it up without a fight." The second group are those who want to get the Ph.D. or the doctorate. They want high status and they want more of the economic goodies of this life. And then there is the third group, and this is the one that has caused unexpected trouble in recent years. They are those who have to provide the money so that those who have the Ph.D. will teach those who want to get the Ph.D.

First of all, let's start with those who want to get the Ph.D. or some other advanced degree. We have already seen great pressure over the last twenty-five years for this group to expand in numbers. Nor are there in my estimation many signs that there is going to be a decrease in demand for degrees in higher education, and for the simple reason that the degree has become a means of access to economic position. The Ph.D. is increasingly viewed as a means of access rather than regarded in terms of the original notion of the Ph.D., that is, as entailing a contribution to knowledge. It will be looked upon as a way to get along better in this life. For a further example, look at what has happened in state after state in teachers' education, where we now have the master's equivalency in which a person takes a certain number of hours, no degree is required, and the automatic salary bump goes up.

Also in this society, for better or for worse, there are minority and disadvantaged groups who have caught on to the fact that a college degree, and more particularly an advanced degree, is one method of upward mobility. These minority and disadvantaged groups are not going to cease their demands to be admitted to higher education. I speak of Blacks across the country, Puerto Ricans in New York, and perhaps even the Indians in Arizona. The Ph.D. is one way to get professional status and prestige for them, too. It will not cease. These people will want higher education degrees. Now, if the criterion of achievement is going to slow down the access rate to higher education, it is certainly going to filter out large numbers of the minority and disadvantaged students. Consequently, the pressure from these groups will be to do away with that criterion. I think this is what is happening; the earlier standards which were fitted for a small group, a small group of the citizenry, just will not do. I think this is the reason these standards are going by the board.

There may be some justification for it; I am not arguing that there isn't. But I do believe that, more and more, higher education is going to be measured by the fact that the student gets a piece of paper after he puts in so much time, because the basic goal of the student is not knowledge. His goal is increased economic and personal reward. And the figures, every figure we see, indicate there is not going to be a decrease in pressure for graduate degrees in the 1970's; it is going to increase.

Now let me preface my remarks in this way about those who hold the Ph.D. I know of no instance in recorded history where those who have had a going monopoly voluntarily dissolved that monopoly in favor of free competition. I think this is the situation with respect to the university faculties.

Right now, as many of you well know, on certain college campuses fear, if not hysteria, is almost rampant in the face of 10 percent salary cuts, no additional positions, *et cetera, et cetera.* This could force university faculties to tighten the monopoly. It could become very critical. And in the broad circle of professional and academic organizations like the AAUP, there are already signs that economic security of the professional group has become foremost among the aims of the organization. If that is the case, there is going to be a pretty big clash between those who want to enter higher education and those who are already in there. The Ph.D. is going to be at the critical point.

From a graduate dean's point of view, the glut on the market for Ph.D.'s would present the greatest opportunity in the world to trade in poor departments. Here is a department of ten people, four producers, four non-producers, and two in the middle; and here are these thousands of fresh, bright Ph.D.'s clamoring for jobs. The smart guy would trade in the non-producers. We would have an uplifting of departmental programs across the country. That isn't going to happen for the simple reason that the existing group of faculty won't let it. They will feel that once this is permitted, then when they become outmoded, they too will be put in the boneyard. It is a very human feeling. I don't blame them.

Now the question is, What will the faculty do in the face of this increasing pressure of people to be admitted to their status? Remember, most Ph.D.'s did not jump up and down with joy when the lawyers created the Doctor of Juris degree. And many a campus has had an incipient battle going on since the medical students complained, as they have, because the Ph.D. was called the highest degree. They resented it, and in some schools it has led to separate graduations for the medical students apart from the Ph.D.'s.

The existing faculties do not have the freedom of choice in this that they would like to have for the reason that the third group, those who are paying for higher education, have had something to say, and loudly, in the last few years.

Let's take a look at those who are paying for the graduate education. I do not mean those who make the decision to release funds. The

National Science Foundation doesn't actually pay for science education in the sense that they get the money, create it. NSF does exercise some control over the release of the purse strings. But it is Congress that gets the money—from the taxpayers. Both Congress and the federal executive have given signs already that insofar as Ph.D. education is concerned, there has been quite enough expansion. Now one easy solution for the faculty would be to continue the rate of expansion of the early 1960's and all of these problems would go away. Universities would absorb all the new Ph.D.'s, departments would get bigger, faculties would teach the disadvantaged, and all of the problems would simply go away. But policy, at least for the last couple of years, has precluded that solution; and I think probably it will be precluded for the first five years of the 1970's. The federal solution, continued inflation, so to speak, does not appear to be a viable one for the faculties.

Much the same thing is occurring at the state level. Wherever the state is supporting a system of higher education, the costs at the doctorate level are high; although they may not be as high as some state boards say they are. But still in the face of all of the other demands for funds in urban areas and for other purposes, the question has arisen whether expansion of graduate education at the state level also is feasible. It varies from state to state; but by and large, I do not think that the expansion that occurred between 1955 and 1965 is going to continue, although in isolated states it might be a bit different.

What I am trying to say is that federal or state supported inflation—that is continually building up graduate departments in the face of ever-increasing enrollments—is not the solution. It just isn't at hand now.

What about the private institutions? The state situation affects mainly and principally the state schools; the federal situation affects both. What about the situation of private donors who over the long years have been the largest single support of the major private institutions? From private sources, there has been an increasing indication that funds are not forthcoming for continual expansion of private institutions. And the downturn of the stock market has even cut into the endowment capital of most private institutions, some very substantially. The recession that has occurred has affected private giving all over the country. Many people think the recession is the cause of the slowdown in private giving; it may be the occasion. I don't really know, but it has happened. Not many private institutions can look forward to faculty and program expansion as a solution if they have to rely upon annual giving or increments to endowments for the necessary financial support.

Finally, in many a private institution offering doctoral work, the person who pays much of the cost of graduate education is the undergraduate student. He pays a high tuition to be lectured at by teaching assistants for two years, and occasionally he sees a professor in his last two years. Much of his tuition, so it is argued, really goes to the support of graduate instruction and graduate research. Most private institutions have been continuously raising tuition. We may have come to the end of the line on that. Again, the inflationary solution is not going to be available in my estimation, at least not at the rate necessary to continue the easy method of 1955 and 1965.

Now, if inflation is out but there is a demand for more graduate degrees, what then are the alternatives? Well, let me sum up a little bit and then mention two.

It seems to me that the major Ph.D.-granting institutions, or doctorate-granting institutions, are pretty much like a number of corks bobbing around on the turbulent seas or tides of higher education today. They can't do much about it except decide either to float slowly or run rapidly with the tide. They can't stop the spring tide toward an increase in the number of people who will seek higher education. They can't stop that—it's on the way, it's coming, it's here. What they can do, I suppose, is jettison themselves and take some other steps to save themselves as individual institutions. This means, I think, that any general conscious national policy as to what to do about the Ph.D. is not likely to be arrived at. We may arrive at one by looking back several years from now and seeing a number of individual steps that were taken and then impute a policy to explain what happened. Let me illustrate this. One way of meeting this situation would be to make the Ph.D. a very inclusive degree, to make it very flexible so that it could comprehend, for one example, the Doctor of Engineering degree, in which the application of skill rather than the creation of new knowledge would be the equivalent of the research requirement. It could also take over the methodological type degree, which is epitomized by the Doctor of Arts or the Doctor of Education. As a result, we would have only the Ph.D., no other doctorate, but various kinds of Ph.D.'s, in all institutions across the country.

This is not likely to happen for the reason that in certain institutions, particularly those in the A.A.U. and especially the private ones, faculty resistance to making the Ph.D. all-inclusive would be too great. To these faculties the research Ph.D. is a status symbol, as it is to me, and they aren't going to give it up easily. They would rather fight than switch, that is, make it flexible. They may go a little bit along the lines suggested by Dean Cooke, that is, let students put fourteen research papers between black covers for a dissertation, but they still will ask for the fourteen research papers, and that's the big difference. Some institutions, then, and probably the most prestigous, will resist down to the hard core making the Ph.D. all-inclusive. This doesn't mean that other institutions will not move to make the Ph.D. more flexible. So I don't believe a universal trend to make the Ph.D. the sole doctorate throughout all institutions is going to result.

What about the opposite tack, to move to harden the requirements for the Ph.D., to crystallize them? Well, this means in essence that in higher education other doctorate programs are simply going to emerge. To restrict the Ph.D. in numbers is to create the Doctor of Arts. Let's face it; that's the choice. To base the Ph.D. on the research requirement as demonstrated achievement, a contribution to knowledge, is to create Doctors of Engineering, Doctors of Social Work, Doctors of This, and Doctors of That. To attempt to push one way against the pressure for access to graduate study is to force that pressure to pop up some other way.

Nonetheless, my feeling is that a certain select number of schools—and I say "select" in the sense of self-selected—will probably try to maintain an almost semi-classical view of the Ph.D. These will probably be the best endowed institutions and perhaps a few of the larger state universities. We then have what we have in essence now. A Ph.D. granted by a select group of institutions which will be regarded as superior to (and more marketable) than doctorates granted by other institutions. But there will be this one big difference. The Ph.D. itself will not have the overall predominance in the doctoral area as before.

Developing institutions (and, incidentally, most of the increase planned in doctorate production from the 1970's to the 1980's is not in the established institutions but in the developing institutions) will seem to have a choice. If they have enough Ph.D.'s on their faculty, they will go ahead and create new Ph.D. programs despite what anybody else says. If they do not have enough Ph.D.'s on their faculties and if they have strong-minded graduate deans, they will settle for creating a series of other degrees—Doctors of Arts, Doctor of Mathematics, Master of Philosophy, or whatever you want to call them. But these degrees will be created; these developing institutions will not stop. These institutions are outside of the traditional Ph.D.-granting circles. They are in some of the larger cities that never had graduate institutions or in rapidly growing urban areas. Just like post offices, they are going to be; and they are going to mail letters in terms of advanced degrees.

Now, what is all this going to add up to? Regardless of whether there is an attempt to generalize the Ph.D. and make it all-inclusive and flexible or whether the other path is taken and self-selected institutions move to harden the requirements and other degrees bob up, I think most Ph.D. degrees or most doctroate degrees will no longer be terminal degrees. They will become entrance certificates into various professions—the research profession, the teaching profession, or however you wish to denominate them. Further than that we can look down the road and see that in the several disciplinary areas the mark of academic status and prestige which the Ph.D. once constituted will now have to be awareded by diverse honorific devices within the various disciplines and the various professions.

I am not saying that the doctorandus will come back and be transplanted to the U.S., but I do suggest that the Ph.D. is about going out as the mark of highest achievement as a research degree.

QUESTIONS AND ANSWERS

D. Alpert: I certainly agree with Dr. Brennan that the spirit of scientism has pervaded some of the areas of the humanities and social sciences and, interestingly enough, I think it was the humanists and the social scientists who injected too darn much scientism into their own field, perhaps out of a sense of anxiety at what was the source of truth portrayed by the physical scientists.

It strikes me that the question I have to ask you, Mike, is, How are we going to get this broadened view of the world that includes an understanding of the place of science? By talking about the limitations here, how do you perceive that we will get this broader view of the role of a complex society, the understanding of the values and objectives of science or technology within that world into the areas that you have discussed?

M. J. Brennan: I suppose I could take the position of a grand historical hypothesis and say that we have to allow history to work itself out, that we have to allow the humanities of this era to outgrow their adolescent fascination with the sciences and allow for a new generation of humanists to have the kind of perspective and the kinds of insights that would permit them to develop the kind of perspective that is needed.

So I really don't know. I don't know that one should put down a set of guidelines for how people today ought to re-think the whole humanities. Having emerged from an era in which this phenomenon has existed, I am inclined to believe that we just have to let history work it out and rely on new generations that develop fundamentally different mental sets. And it is only by that route—I mean really deep rooted fundamentally different mental sets—that it is possible to even begin to approach the question of how you incorporate science and technology into a set of values for society which I think now lies at the heart of some of the stress that is going on within our universities and, indeed, in society at large.

I don't think we are capable of doing it. I think that somebody else is going to have to do it for us.

W. D. Cooke: I would like to challenge Mike on his ideas about scientific method. I think there is such a thing, I think it does exist, and I think we would be a hell of a lot better off if the social scientists used it.

M. J. Brennan: I would be prepared to argue that among the group normally categorized as social sciences, probably economics is closer methodologically to the nature sciences than any other.

But if I had to draw an oversimplification about the development of economics, I am afraid I would have to say that in the process of becoming more and more scientific, economics or the economists began to look down their noses at those fuzzy-wuzzy, soft-minded people in sociology and political science. As a consequence of this, there was a tendency toward isolationism. "We have more powerful tools, we use modern statistical inference, we can prophesy, and so on. The others can't; they are inferior and, therefore, let us concentrate our energies on a set of problems which are most amenable to this method."

I think what we are facing today is perhaps a situation in the society that says the economists can go on this way, developing more and more refined growth models and more and more refined and sophisticated quantitative methods designed to cope with problems that are useful to a smaller and smaller audience, while, in the meantime, the cities decay and so on and so forth.

D. Alpert: If I may, I would like to inject a comment into this particular argument. I happen to be on neither side in this issue, and I would like to characterize the situation somewhat as follows: it strikes me that if there is too much scientism in the humanities; it is also true that science plays a special role, but not a dominant role in engineering.

In the solution of real problems, one needs to bring to bear both art and science. The design of useful solutions calls for invention—both technological invention and social invention—which also involves the consideration of human values. Hence we will need a new type of person, the inventor, whose domain is the world of real problems. This is an area in which universities have not played a major role heretofore. And it is characteristic of the situation that one can predict in advance the performance of a future scientist; one cannot predict in advance the performance of an inventor.

The application of knowledge to real problems is not part of our tradition. People from industry say, "Don't train an interdisciplinary man, train a good old-fashioned specialist and let us fit him into the fabric of our company"; and they do. Industry has very good corporate arrangements for finding out which are the inventors, which are the scientists, and which are the future managers and janitors of their corporations.

I am afraid, however, that the industrial corporations of the country, while playing an important role, are not playing a decisive role in the future of our society. Solving industry's problems is not necessarily going to get us out of some of the societal problems we face.

And so I happen to believe that resolutions will come from people who are committed to providing society with some intellectual options. Solutions will call for invention as well as research, and will require an understanding of the aesthetics, the social complexities, and the scientific issues that underlie the problem.

For such activities, the structure of our university community just is not right.

The departmental structure and the filtering process which demands that a man do the same thing in a field of specialization for fifteen or twenty years before he is really accredited as a senior citizen is not the ideal preparation for the man who is to provide the intellectual options for some of the problems of society.

And, as you know, I have proposed a new position in the university, that of an all-university professor without tenure.

L. G. Humphreys, National Science Foundation: I have a question for Dean Cooke.

One statistic bothers me. This is the proportion of Ph.D.'s who publish after the disertation. I am not fully aware of all the statistics here that would be relevant, but are there substantial differences among the disciplines in the number of Ph.D.'s who publish following their degree, and have there been any trends in this statistic over time?

W. D. Cooke: As a matter of fact, I tried to get those statistics. One study is available which shows that a very small percentage, I think something like 15 percent of the Ph.D.'s., ever publish anything beyond their thesis. That, unfortunately, was not broken down by disciplines. I don't know if more detailed information exists. It would be very interesting if it did. I suspect that in all areas the percentage is disappointingly low.

R. E. Wolverton, Miami University: In my limited work on this very subject I found about a low of around 13 or 14 percent in biological sciences, up to a high of about 23 to 24 percent reported by Don Cameron Allen of Johns Hopkins, who did the work in English. In Allen's study, which was a comprehensive ten-year study of English doctorates, that figure of around 23 to 24 included any type of publication at all whether it was really scholarly or not. So it isn't really encouraging. On the other hand, there have been some who commented, "Thank God people don't publish," because what would our world look like if they did?

A. H. Proctor, Kansas State College of Pittsburg: This question is for Dean Alpert. With reference to his presentation about the computer program and network in Illinois, I would like to ask him to comment briefly on the impact of this technology upon the various disciplines. Will it be equal? Which ones will it have the greatest impact on?

D. Alpert: As a matter of fact, I find it difficult to answer that question. The studies which are the most obvious are not necessarily in the most impressive areas where computer-based education can make a contribution. For example, in the instruction for any new language, whether it be at age four or at age forty, computer-based education is a particularly valuable tool.

But what is exciting to me is that some very interesting things are happening in virtually every area of education, including political science, chemistry, demography, genetics, veterinary medicine, and computer science. Of course, computer-based education is a natural for teaching any of the mathematical skills. But perhaps some of the most exciting things are happening in fields like economics and political science, where some of our courses that were voted among the ten worst courses on campus are getting a real face lifting.

L. G. Crocker, Case Western Reserve: I have a question for Dean Deener. I confess I am a little confused by the relationship between three elements in your presentation. One is the decrease in support for higher degrees. The second is the increase in demand for higher degrees. And the third is the proliferation of new degrees such as the Doctor of Arts. Can you clarify the logical relationship between these three dynamic elements?

D. R. Deener: I don't know whether they will be logical, but I think there are empirical connections. The movement has not been to shut off higher education, but rather to open it up, with, however, the amount of resources not expanding. This means that you have to get a more economical unit of product. The Ph.D. is very costly simply because the research component of the Ph.D. takes so much of the professor's time and salary. Hence other degrees are being proposed in which more of the professor's time can be put on instruction, particularly something other than one-on-one research instruction, and in this way you get more product at a lower unit cost.

I don't know whether that is logical, but I think that is what is happening.

D. Alpert: Dean Deener, I wonder if it is your perception that we will align ourselves on the two issues concerning the Ph.D. by institutions, or will it be by disciplines? So far I don't see any clear indication that our institution, for example, will take sides on this, but I have strong reason to believe that some of our departments are perfectly willing to add Doctor of Arts degrees and others are opting to broaden the nature of the Ph.D.

D. R. Deener: I noticed that, too, Dean Alpert. In Tulane there are departmental differences. The bulk of the reaction has been not to favor the institution of the Doctor of Arts thus far.

And while it has been disciplinary, it has been disciplinary in a very peculiar sense. Those departmental programs which, in our context, have status and prestige have been most reluctant to offer the Doctor of Arts. Those programs that want to get in at the doctoral level have grabbed at the Doctor of Arts as the way to get a doctoral program.

I think that the disciplinary tie here will, in the end, give to the institution situation. I think our graduate faculty, if it voted, as it may two weeks from now, would turn down the Doctor of Arts. I feel quite certain that some other institutions, particulary new satellite state universities just trying to get into graduate work, if they had an option to vote for the Doctor of Arts, would embrace it.

In reply to the question that you mentioned, cooperation or division of labor, there is certainly a possibility, but there is a Middle Eastern proverb, "If cooperation were feasible, Allah would have had a brother."

This is what you find happening in your state systems. With respect to the central, the established, the old state university, the pattern has been that they want to become the supreme advanced degree institution. With respect to the emerging colleges, or whatever they are called, that are developing, the central state university will let them slide along so long as they don't compete either at the Ph.D. level or in football. This is really a curious thing. If the home campus can have, you know, the Bowl team and the Ph.D. programs, the rest of the schools can have anything they want, except they now have Ph.D.'s on their faculties too.

Your states, as you well know, are trying to devise plans for a division of labor, It would make sense, really. But I think it is going to be hard to get.

G. K. Fraenkel, Columbia University: I would like to return to the question that Dr. Humphreys raised. I don't intend to put words in Dr.

Humphreys' mouth, but many persons have raised the question he raised about the fraction of the Ph.D.'s produced who actually ever publish. And as Dean Cooke indicated, there is not very good data on this.

Of course, in the sciences those persons who go into industry or government often do not publish in the scientific literature, but they can do a great deal of publishing internally, within their own organization, and also in the patent literature. These publications would not be included within the type of tabulation that has been referred to.

I think, however, the data on this question is really irrelevant. I think that what is important in higher education at all levels, and particularly at the highest level—and I will maintain that the Ph.D. is still that and must remain that, despite what the M.D.'s say—that teachers have to be aware of when they know something to be true in their discipline and when it may be suspect. They have to know, as someone said yesterday, how to evaluate information which appears in the literature and whether it has been properly researched or not. The only way, to my knowledge, that this skill can be acquired by most persons is by actually performing some research themselves, and this is one of the important reasons that a research dissertation is so important.

Now a substantial objection to many dissertations is that they do not provide adequate experience in making this kind of discrimination, that they do not provide the kinds of skills that the student must develop. The questions to ask are: Is what is required in a dissertation good in terms of the kinds of skills that the student is exposed to and must acquire, must work at and demonstrate? and Is the quality of the thought that goes into the work of high quality, as well as being a contribution to new knowledge? It is with respect to these questions that the attack should be made, not on the fact of whether there is or is not post-doctoral publication.

C. E. Falk, National Science Foundation: Most of the emphasis this morning with respect to Ph.D. training has been on the development of knowledge and on adding to the knowledge base.

How about the situation from the point of view of applying that knowledge to solve some of the problems of our society? Are we doing enough in training our Ph.D.'s to make them capable of using the knowledge they have attained; and if not, what do you suggest?

D. R. Cooke: That question is related to a point that Dan made which I think is a very good point. What do you do about inventors, the people who do things with their knowledge? I guess I am at a loss to know what to do.

How would you change, say, an engineer into an inventor? I would love to find some mechanism. How can we identify an inventor? What sort of person has this creative understanding that ties his knowledge in with particular problems is a very difficult thing to ascertain while he is training, and I do not know just how we would ever find a mechanism for doing so. I hope it is not impossible. But I am pessimistic, at least for the short-time scale, that we are going to be able to identify those people in any way.

D. Alpert: This is an area to which I have devoted all of my academic professional years, and I think that the critical issue here is to have some people around the faculty that have a feeling for going about solving a real problem.

Now one of the possibilities in attacking real problems is that you can fail at it. In academia we in the sciences, especially chemistry, have ruled failure out of existence. We can train a man in four years. (In physics, we give him a chance to fail once or twice or to have the apparatus fall apart, and it takes six years.) The most educational experiences I have ever had have occurred when I have failed to accomplish something I really tried hard to do.

The scientific researcher's capacity for writing publications on schedule, once a year or in time for the next annual conference, is one of the things that was so appealing to the social sciences and humanities. Here are regular Brownie points. Once you get into the academic establishment, you count the papers and you have a quantitative measure of success.

In the applied area, if we in academia propose seriously to tell our sponsors that we are working on a real problem, they really will be able to tell whether we have succeeded, whether we have failed, or whether we have just published another paper. And that represents a tremendous challenge to our institutions.

We had better be careful about this one. If we take on the challenge tossed to us by the National Science Foundation—really by the Congress of the United States through the very clear voice of the Committee on Science and Astronautics, headed by Congressman Daddario, saying that applied research was also important—we had better be careful because there are measures which society can apply to answer the question, "Well, O.K., you worked on the problem. Has it been solved"?

One of the other interesting things about applied problems is the following: If you don't succeed in solving it, the problem sticks around a long time; if you do succeed, you have eliminated the darned problem and all of a sudden you are going to find yourself out of work. And that is no trivial issue, because almost all of the national laboratories, such as the A.E.C. laboratories, really lost their intellectual excitement after they solved their first major problems.

So if *not* solving them can represent a problem, solving them can be catastrophic.

What the institution requires is a realistic sense of what the game is about and an understanding of the nature of the relationship between the people engaged in the applied activity. We all agree that there should be people from different disciplines; that is a rather trivial aspect of the personnel requirements.

What is the nature of the relationships between those people? The instinctive reaction of the academic staff member is that the proper relationship between people from different disciplines is membership on a committee. And that concept is one of the most catastrophic of all academia. The assumption that if people are going to come from different areas and work together, their efforts must be in the format and even bear the title of a committee is what destroys most of the activities in this area.

All too often, the truly interdisciplinary activity of a committee ends as soon as the ink is dry on the proposal. As soon as the money comes in, the participants go back into their little departmental boxes and distribute the money in a more or less equal way.

We are operating in a different environment; and if we have something to teach a young man about solving a problem, it is necessary to integrate him into an environment in which he sees how people can really cooperate. That implies that a real problem-oriented activity is going on. When he actually takes on a piece of the problem, I think he is going to look very much like a mechanical engineer, a chemist, an economist; but his relationship to the problem and to the team of other people working on it is going to be different. And that is the dimension that I would add to the intellectual exercise.

We cannot provide such an environment, however, until we have built one; and that is the central challenge. It is not a matter of creating the right number of courses and stringing them together, or selecting the right groups of disciplines. One must begin by seriously attacking problems big enough to take more than one human being to encompass them.

I hope that people in the National Science Foundation, people in academia, and people in other walks of life will sit around a table and toss around the issues of how you get a real problem-oriented effort started. And I would propose that you do not start it with a committee but that you start it with an individual with an idea, just as with most other innovative activities. And if he also has the qualities of personality and leadership that will permit others to work with him on a problem, you have the beginnings of an adequate environment. In the absence of that kind of an environment, the student's experience is not going to be as good as it would be if he had stayed in the disciplinary box that he came from.

With regard to this applied activity, by the way, the Brownie points in the reward system are different. If the problem is tough, it may take five years before you know whether you have made progress; and you may not be able to publish significant papers in the process. So we have some real problems with regard to our reward system and with regard to our system for identifying leadership.

Hence it was not a facetious comment that I made about establishing the rank of all-university professor without tenure. I think we really have to limit tenure. Give such a person a long enough time to take a crack at the problem. That means five, six, or seven years. But let's not provide the ones who do not have the talent or motivation to solve problems with a license to practice that game forever.

Don, I wonder if you could respond to my comment that we have legislated failure out of our own gains and in chemistry we have legislated failure out of the educational process?

W. D. Cooke: Of course we haven't legislated failure out of the research process in chemistry. When you say that in physics you give students a chance to fail by adding two more years of research program, I just don't believe it. I think many students are given problems and frequently get off to false starts. There is an excruciating period in the beginning of their research when they are having difficulty feeling their way. A second year research student is a pretty miserable man because problems normally don't work out as quickly or as obviously as he supposed. That is the time in which he needs all the personal comfort he can get. He is facing failure continuously. It is only in the last six months when things break through for him that he collects all the data for his thesis.

So I don't think we are legislating failure out of the system at all.

J. L. McCarthy, University of Washington: I am a long-time advocate of practitioner's degrees, and I think that Dr. Falk has raised absolutely the core question for this session: Can the Ph.D. degree be broad enough to encompass both research-oriented and practice-oriented programs? I think definitely it cannot.

Now, we already have available some clear models for practice-oriented doctoral programs. The Doctor of Medicine, of course, is a clear case of a practitioner's degree, and the M.D. program emphasizes how to apply existing information rather than how to discover new information. The Juris Doctor is another illustration.

In engineering, I think our society urgently needs a practice-oriented doctorate that would prepare a few outstanding people to apply existing knowledge to the solution of major engineering problems at the highest level.

Perhaps we now can begin to recognize a new field that might be called social engineering. How can the things we already know in both the natural and social sciences best be fed to some bright people who have the capability and the motivation to propose solutions?

I think we have good models for practitioners' programs. I think that the development of a number of such programs ought to be in the highest priority category for all of us, both at the master's and the doctor's levels.

F. N. Andrews, Purdue University: I am compelled to speak on this issue. We in the universities do work on real problems which are of great importance to society and to individual people.

Consider the cell, whether of human, animal, or plant origin. I can think of no problem involving the basic mechanisms of cellular activity which does not have the potential of application to real and practical problems. We have only a meager understanding of immunity-resistance to disease. Since this is a cellular phenomenon, it is entirely possible that one of the hundreds of studies now underway on the permeability of cellular membranes may provide the answer.

Most non-biologists assume that a diagram for mitosis explains cell division and that it is perfectly understood. This is not the case. When we finally understand the nature of cell replication, we will understand the nature of cancer, the nature of certain diseases; and will be able to control genetic errors or to more effectively limit population.

We are all currently concerned about the quality of the environment. Soft coal contains large amounts of sulphur, which when burned releases a toxic gas-sulphur dioxide. If sulphur dioxide were harmless to cells, we would not be concerned. Many of our environmental problems that deal with health are in reality cellular problems. In summary, there is nothing so trivial that deals with living matter that cannot contribute to knowledge in a practical way.

Tenth Anniversary Luncheon

Thursday, December 3, 12:30 p.m.

Presiding: Mina Rees, *Chairman, Council of Graduate Schools*
Speaker: Gustave O. Arlt, *President-Emeritus,*
Council of Graduate Schools

Gustave O. Arlt

For the United States the years from 1957 to 1967 were the Education Decade, a time of unprecedented burgeoning, growth, expansion, and affluence, the like of which had never been before and the like of which may never come again. It began with the intellectual and emotional shock of the launching of a space vehicle in the Soviet Union. This event suddenly awakened the nation to the alarming, even terrifying, realization that American science and technology were no longer supreme, that our leadership was threatened, was, indeed, already slipping away. The year 1957 is not so long past but that many of us remember the torrent of hysterical writing, not so much in learned journals as in the popular periodicals, the daily press, and in that most hallowed sounding board of public opinion, the *Congressional Record.*

Until October 4, 1957, the universities, the graduate schools, and their scientific research had been far below the visibility level in national priorities. On the morning of October 6, 1957, they stood in the glaring limelight of public attention and criticism. "Why had American education," the pundits asked, "fallen behind in the race for scientific leadership in the crucial phase of the Cold War?" The answer came promptly, loud and clear, from the universities, the learned societies, and the agencies of the federal government: "Give us the means, and we will do the job." The reaction in the Congress was swift and decisive. In the closing weeks of its first session the 85th Congress drafted and enacted the most comprehensive piece of education legislation since the Morrill Act of 1863, the National Defense Education Act. Moreover, considering the climate of hysteria in which it was conceived, it was a remarkably sound law. But it was never intended as a measure to improve higher education for its own sake. On the contrary, it was a clear charge to education to win the Cold War. The salient word in the title of the Act was not "Education" but "Defense."

That was the beginning of the Golden Decade, in the course of which the 86th, 87th, 88th, and 89th Congresses enacted more than sixty education laws, over half of them providing primarily for the graduate level. The Decade ended in the first session of the 90th Congress. If one wants to set an exact terminal date, it might be June 20, 1967, when the new Military Selective Service Act put an end to the deferment of graduate students. Not that this Act in and of itself had any particular significance, but it was symbolic of the changed attitude of the Congress and of the public toward graduate education, toward the universities, and toward scientific research. Many factors contributed to this reversal: dissatisfaction with the results of research, disillusionment regarding the values of advanced education, uncertainty and confusion within the universities, intransigence of faculties, dissidence of students. *But basically the reason for this alienation is the failure on the part of legislators, the public, and even of academics themselves to understand that education is the long-term answer to the problems of mankind and not an instant panacea for immediate ills.*

Near the midpoint of the Golden Decade, before it had even reached its zenith, this organization, the Council of Graduate Schools in the United States, came into existence. On March 22, 1961, the representatives of ninety-one universities, from a list of ninety-nine invited, met in Chicago, adopted a constitution and criteria for membership, and elected officers and an executive committee. The committee was instructed to send invitations to membership to some hundred institutions who met the criteria, to establish an office in Washington, and to prepare a program for a First Annual Meeting. They performed their functions promptly and well and deserve mention at this commemorative occasion. Of the eight, four are still doing business at their old stand—more power to them! They are Dean John Petersen Elder, at Harvard; Dean George Holmes Richter, at Rice; Dean Herbert Rhodes, at Arizona; and Dean W. Gordon Whaley, at Texas. Dean Henry Bent of Missouri, chairman and guiding spirit of that committee, has retired and whiles away his leisure hours as professor of chemistry; John Weaver, then dean at Iowa, now occupies the hot chair of the presidency at Wisconsin; Father Robert J. Henle, then dean at Saint Louis University, is president of Georgetown University; and Robert M. Lumiansky, then dean and provost at Tulane, is now professor of English at Pennsylvania. The Council owes a permanent debt of gratitude to these eight men who laid down the first building blocks of the structure that stands here now.

Three-fourths of the people in this room were not present at the First Annual Meeting of this Council, at the Mayflower Hotel in Washington on December 14 to 16, 1961. So it may be more than act of piety to review briefly what happened on those memorable days. Dean Bent, in his opening remarks as chairman, said that he had never seen so many graduate deans assembled in one place. He should look in here today! There were actually one hundred and thirty-two plus a few associate and assistant deans, plus eight or ten representatives of federal agencies and private foundations. There were also a few presidents who presumably came to see what their deans were up to.

Among the prominent speakers at that initial meeting were Sterling McMurrin, then United State Commissioner of Education, now happily returned to decanal ranks as graduate dean of the University of Utah; Homer Babbidge, then vice president of the American Council of Education, now president of the University of Connecticut; Alexander Heard, then graduate dean at North Carolina, now president at Vanderbilt and recently chairman of President Nixon's Committee on Student Unrest; and finally Senator Wayne Morse, then the powerful chairman of the Senate Subcommittee on Education. All in all, it was a good beginning, a small beginning to be sure, but even then the Council attracted speakers of prominence and distinction.

Skipping lightly over the intervening brief but eventful years, we assemble here today to celebrate the tenth anniversary of the Council of Graduate Schools. It's a curious thing about anniversaries, no matter what they commemorate—births, weddings, foundings, or what-not—we always celebrate them with faces turned to the past, happily remembering accomplishments, gloating over achievements, or, perhaps, just thinking, thank God we've managed to pass another milestone. By rights all anniversaries should take place in January, the month dedicated to the Roman deity Janus, whose two bearded faces, back to back, look one into the past, the other into the future. To me the look into the future is infinitely more important than the look into the past. And before we leave Janus, I remind you that, in addition to his other responsibilities, he is also the tutelary deity of doors and doorways, symbolizing, perhaps, the thought that every anniversary closes the door on the past and opens a door on the future. But then, *every* day in *every* year closes and opens those two doors. Time is an unbroken continuum and "What is past is prologue."

So I will not spend much effort reviewing past accomplishments and savoring past successes, even though they should not be forgotten. Perhaps our greatest achievement is that the Council of Graduate Schools exists and continues to exist. Its establishment was by no means universally welcomed in 1961 for it shook the hegemony over graduate education which the Association of American Universities had exercised since the beginning of the century. It was not an altogether easy relationship, but the cautious policies of the Council toward vested interests soon allayed their apprehensions. It makes me very happy that many of those who viewed our establishment with concern are now our good friends and supporters.

A second important but unheralded and almost forgotten achievement took place long before the First Annual Meeting, specifically on March 22, 1961. I am referring to the establishment of the broad and liberal base for membership criteria which made possible the acceptance of all institutions that conduct bona fide graduate work in a reasonable number of liberal arts disciplines. The discussion at that organizational meeting in Chicago was protracted, animated, and at times heated. After the defeat of a motion to limit membership to Ph.D.-granting institutions, a second motion proposed two classes of membership, regular for doctorate institutions, and associate for those that award only the master's degree. For a while it was touch and go, but the tide was turned when the dean of one of our most distinguished universities arose and quietly said, "If this Council is to consist of first and second class citizens, you can just count us out." I have said it before, but I say it again, that our broadly inclusive base is the greatest source of our strength. If it were less inclusive, our influence in Washington would be vastly attenuated. And besides we would make mockery of our stated objective, "the improvement and advancement of graduate education," if we meant only making the strong stronger.

Although I am greatly tempted to linger fondly over the accomplishments of the past ten years, I shall resist the temptation. They have been adequately reviewed year by year in my annual report to the Council, and for anyone who did not hear them, they are printed in clear detail in the *Proceedings* of our meetings. I shall therefore confine myself to brief mention of the four or five actions that I regard as landmarks in the ten years.

The first of these is the creation in 1963 of the Commission on the Humanities by joint action of this Council with the American Council of Learned Societies and the United Chapters of Phi Beta Kappa. This, and the ensuing intensive campaign, resulted in the following year in the passage by the Congress of the Act establishing the National Foundation on the Arts and Humanities. Aside from the almost immediate impetus it gave for the revival of humanistic studies, the significance of this action is best documented by the fact that the Foundation is the only federal education program that survived the 1969 economy drive unscathed and, in fact, emerged with a substantially larger authorization and a somewhat more liberal appropriation.

The second landmark is the establishment of the African Graduate Fellowship Program. It began on a very modest scale in 1963 and grew slowly until, by 1970, more than six hundred young Africans from twenty-seven countries had received graduate training and degrees in the United States. Over ninety percent of them have returned home to occupy important posts in the economy or the educational systems of their countries. It is no exaggeration to say that the Council of Graduate Schools has played and is playing a major role in the development of Africa.

In the area of "the improvement and advancement of graduate education," which the Council's Constitution singles out as the primary function, the Consultation Service and the concomitant Summer Workshop have become increasingly valuable. Not only have several hundred departments in some eighty or ninety universities and colleges profited by this service, but also about one hundred and thirty new or almost new deans have attended the Workshops.

Finally, the establishment, jointly with the Association of Graduate Schools, of the Graduate Record Examinations Board was a most timely and salutary action. It placed the Record Examinations under the direct and sole control of the graduate schools and provided the means for their continuing review and improvement. But even more importantly, the liberal financial arrangements with the Educational Testing Service make it possible to conduct research in many area of higher education that are only remotely related to testing. Useful and sometimes essential as such research may be, it could neither be carried on nor published without the income derived from the testing operations.

So much for the retrospective face of Janus as he quietly closes the door behind him and opens the one through which his prophetic face may look into the future. I wish I could tell you that the vision he sees there is bright and shining. You know as well as I that it is not. We face a future that is clouded not so much by uncertainty, as we optimistically believed only three or four years ago, but rather by the growing probability that we are rapidly moving toward major disaster. I am not speaking at the moment of the microcosm of our universities, to which I will presently return, but of the national and international macrocosm of which we are a part. That macrocosm is sick, very sick. Whether we look at that segment that is called The Establishment or that which calls itself The Radical Opposition, we see nothing but the same dishonesty and corruption. What confidence, even what hope, can there be in a society in which Truth has been replaced by something called Credibility? In which an untruth is not a lie but a Credibility Gap? In which Ethics is a synonym for Expediency? In which Morality is not what is right but what you can get away with? Enough of this! I didn't come here to talk about the ills of society. There's little we can do about it anyhow except to carry out our educational mission with increased zeal and devotion and to hope that the frayed fabric of society will hold together until we can produce a new generation that will honor the values and virtues that are now in danger of being lost. So let us return to the realm of our own responsibilities, to our graduate schools.

Much that I might say to you today I have said to you before, and I can only repeat it and perhaps draw some new inferences from it. I told you in 1967, in the words of the 41st Chapter of the Book of Exodus, that "there came seven years of great plenty throughout all the land of Egypt; and there shall arise after them seven years of famine." The lean years came sooner and are leaner than I had anticipated, and whether there will be seven of them or more or less, I do not know. But this I know, that we had better be prepared for them. It is too late to temporize. Deficit financing is not the answer, nor will increased tuition fees serve much longer. Some of our private colleges and universities are already pricing themselves out of the market. I do not believe that the new veterans' benefits will bring a flood of students into the graduate schools, nor will the abatement—I hesitate to say the end—of the war release vast sums of federal money for graduate education. Whatever will become available will be spoken for by more imminent priorities.

The public universities will, of course, weather the storm under the watchful fiscal eyes of state legislatures and boards of higher education. The great, well-endowed private institutions will tighten their belts even more strictly than they have already done, but their endowment income will sustain them. The ones that are really in great trouble are the many private colleges and universities that have no substantial endowments or other reserves. For them the best prospect is regional cooperation, retrenchment in over-extended areas, consolidation of weaker departments in consortium arrangements with other institutions. Consortia of a sort have existed for more than a decade, but so far none of them have taken advantage of the full benefits they could offer. A liberal policy under which students may register in one institution and take work in one or more others is good, but no longer sufficient. Consortia can be made to serve two purposes—the first, to enrich the educational opportunities for students; the second to effect economies in operation. So far only the first purpose has been served. Now the time has come to study the second purpose seriously. If properly implemented, such consortia will vastly strengthen the educational potential of geographic regions and in some cases may mean the difference between survival and ruin of institutions.

I am well aware of the obstacles in the way of the establishment of consortia. First of all, justifiable institutional pride that resents the surrender of part of its autonomy; second, faculty resistance to the phasing out of programs that are no longer viable; third, the long-established attitude of regional competition rather than cooperation; fourth, the differing systems of fiscal control, and so forth. Because of these and other obstacles that make it difficult for individual institutions to initiate such arrangements, I am suggesting that this is a matter with which the Council of Graduate Schools should seriously concern itself as you enter this troublesome period. I suggest the establishment of a Committee on Consortia that should first examine carefully the character and potentials of such arrangements; that should then apply its findings to the possibilities of selected regions; and that should, finally, develop a small corps of experts that would help institutions to initiate and to develop appropriate forms of cooperation. You will recall that your Constitution specifically charges the Council "to examine needs, ascertain best practices and procedures, and render assistance as indicated." Well, this a need, a great need. In my thinking, the consortium is one of the first priorities for the Council as you enter 1971, and I suggest you give some thought to it.

Another area that should be a matter of the greatest concern not only to the Council as a whole but to every individual graduate dean is the form which advanced education will take in the future. In the summer of 1968 I presented a paper at the Workshop at Lake Arrowhead on the future of graduate education. It was subsequently published in several journals and elsewhere, and I suppose that many of you are familiar with it. Very briefly, I forecast the gradual evolution of an integrated system of advanced education, beginning at the post-junior college level and continuing through life. The first four years after junior college would consist of full-time study, and the attainment of this level would be marked either by an intermediate degree or a certificate of limited professional competence. This point would be approximately that of the present master's degree, and the student would be about twenty-four years old. At this stage he would be encouraged to seek employment in his profession and to continue his education with a doctoral degree or continue it throughout his life.

Since I made this forecast, a number of developments have taken place that seem to support it. The number of part-time graduate students has risen to an all-time high of 73 percent of the total. The departments of higher education in several states are asking the colleges under their control to develop a broad range of different levels of part-time education, and the several federal granting agencies are for the first time in history talking about subsidies for part-time students.

Most significant, however, is the Fifth Interim Report of the Carnegie Commission on Higher Education, which was issued just two weeks ago. It recommends an integrated system of higher education very similar to the one I foresaw and, if anything, even more drastic. It advocates the telescoping of the senior high school and junior college into three years and the integration of the senior college and the master's level into another three years. It recommends two years of full-time study for the doctorate, but favors a period of three to four years of part-time study for the terminal degree. It strongly recommends the Master of Philosophy as an intermediate degree and the Doctor of Arts as the degree for most teaching scholars, reserving the Ph.D. for those whose major careers will be in research. Finally it recommends post-degree, not only post-doctoral study, for all who wish it.

This then, or something very much like it, is the form which advanced education of the future will take. It won't happen overnight, of course, but the trends are apparent and the recommendations of the prestigious Carnegie Commission will carry much weight. I am sure that they will not be enthusiastically accepted by academe. Certainly the hierarchy of the undergraduate college will contemplate the downgrading of the baccalaureate with nothing but dismay. And certainly no graduate dean can view the predicted erosion of full-time graduate study with equanimity. Not all will readily accept the Doctor of Arts, although it has already made considerable progress, and many have mixed feelings about the Master of Philosophy.

Needless to say, such a drastic realignment of all of higher education will have profound effects on the graduate schools. They may perhaps continue to exist and to function much as they do today. Or they may become a superfluous apparatus and their functions decentralized to academic departments or other structural units. In my thinking, the most satisfactory arrangement might be a merger of the senior college, thus creating a logical unit of the highest level. But before a final structure is achieved, you may be sure there will be a great power contest between the various academic and professional units for the control of graduate education. The academic departments, which in some universities have already made inroads on the authority of the graduate school, will push for complete decentralization and departmental autonomy. The professional schools will do the same. And the well-organized adult education and extension divisions will make a concerted effort at least to share in the control of post-degree education.

These are some of the problems which you as individual deans, and the Council as your action arm, will soon face. But no matter what organizational form graduate education may take, there is one function that the dean must never relinquish, and that is the supervision and maintenance of the highest standards. Nothing could be more disastrous for the quality of our highest levels of education than to share the responsibility and the degree-granting authority with academic and professional units that were established for quite other purposes and that over the years have developed philosophies directed toward much more limited ends than those of the graduate school.

So the final brief and perhaps only admonition I want to leave with you is this: Look beyond the vexing problems of today and tomorrow to those of 1972 and 1975; remain constantly alert to the development of the impending changes; be prepared to lead rather than to follow. And above all else, remember that the graduate dean is not a cog nor even a big wheel in the academic machinery, but the custodian of the quality and the values of highest education. And I close with the words of Polonius to Laertes: "Farewell, my blessing season this in thee!"

Concurrent Workshops

Thursday, December 3, 3:30 p.m.

WORKSHOP ON AUTOMATION OF RECORDS

The workshop program consisted almost entirely of a report on the automated graduate record system at Texas A&M University by Dr. George W. Kunze, Dean of the Graduate College. He described in some detail the automated system developed at Texas A&M and responded to questions.

The student uniform record system at Texas A&M University is a computerized file of data containing pertinent information on each student at the University. Information on a student enters the file when he receives admission to the University. The information is maintained and added to through a continuing update system.

The data file on each student is developed as a set of sixteen data cards. These data cards provide for filing a desired set of data on each student. Each student record is uniquely identified by a six-digit Permanent Number which is assigned to a student when he is admitted to the University. This number is used instead of a student's social security number because of a special error check system in use at Texas A&M University that assures the uniqueness of the number once it appears on the data file.

Once the student's record is placed on the data file, it is maintained there until he leaves the University. After he leaves the University, his record is placed in an Inactive History File. While the student is active in the University, his record is constantly being updated. These updates pick up such information as current course schedule, course grades. changes in program, address changes, grade point ratio, *etc.*

The Student Uniform Record File, maintained by the Registrar's Office, provides the basic data for a number of general student related reports such as class roster, grade reports, teaching load reports, *etc.*

The Student Uniform Record File is, therefore, a basic file to be utilized in developing an automated graduate student record system, since most of the desired student data already exists on this file.

The entire system includes automated registration, event sequence, periodic summaries, current enrollment status reports, exemption reports, and graduate student summary reports.

Dean Kunze displayed samples of the work being done and acquainted the group with a booklet published under the title *Automated Graduate Student Records System for Texas A&M University*. Copies of these are available through Dr. George Kunze at Texas A&M University, College Station, Texas.

WORKSHOP ON NON-DEGREE AND CONTINUING EDUCATION

Robert H. Bruce

The classic publication on post-doctoral programs is, of course, *The Invisible University*, based on a study directed by Dr. Richard B. Curtis under the auspices of the National Research Council and published in 1969 by the National Academy of Sciences.

We normally think of post-doctoral fellows as having completed the Ph.D., but one should remember that a certain number of them have completed the M.D., or D.D.S. and are candidates for the Master's or Ph.D. degrees.

In terms of sources of support, it should be noted that the federal government supports over two-thirds of the post-doctoral fellows and that 40 percent of this number are supported by the U.S. Public Health Service, which of course includes the National Institutes of Health. The question then arises, What, in a period of constricting federal support, will happen to the post-doctoral program? The last figures indicate that the universities support only 7 percent of post-doctoral fellowships, and this figure, if anything, may be high. One could express a pious hope that the universities might be able to pay more, but to be realistic, from what I know of university budgets, I am not too hopeful.

It should be noted that the pattern of post-doctoral fellowships is indicative of the heavy support in the basic sciences, such as chemistry, physics, and the biological sciences, including biochemistry, contrasted to the social sciences, the humanities, and education. This is indicative of the research support given to these areas and to the fact that post-doctoral education is definitely linked to research beyond the Ph.D. Happily I can see no push toward a post-Ph.D. degree.

There does seem general agreement that post-doctoral fellowships have been helpful to research programs and to the individuals who receive these appointments. Their status in the academic hierarchy seems a good step above the pre-doctoral student but below that of the assistant professor on a full-time appointment. It is suggested that these individuals be considered regular, if temporary, members of the departmental and college faculties and have the opportunity of participating in the decision-making process whenever possible.

It is further suggested that, to make post-doctoral fellows more visible, their appointments, after approval by the appropriate departmental head and cognate dean, be made in one office, perhaps the office of the dean of the graduate school.

Robert T. Lagemann

Governmental agencies, graduate deans, and others have been asking, "Should we retread Ph.D.'s in view of the present conditions in the academic market place?" I think all of us agree that we ought to improve our original tires, our graduates. We ought to modernize our curriculum, although we may have different views on how to do it. We ought to encourage inter- and poly- and pan-disciplinary programs of study. We should attempt to discover the neo-disciplines and foster them. (Linguistics and biophysics and psychology were once neo-disciplines.) All this would help to prevent the "boom and gloom" cycles we are experiencing.

But it is less clear, at least to me, that we should retread Ph.D.'s for the neo-disciplines, whose birthdates are distant and uncertain, or that we have the resources or the ability to quickly re-educate persons who are in over-supply in particular fields.

To be sure, we always have felt the need of retreading, in a way of speaking. The sabbatical at our universities has been intended in part to serve that purpose, though usually intended for the man who was returning to the same institution in the same position. I suppose each of us aspires to a sabbatical year, though not all of our universities provide them.

The purpose of the sabbatical, we commonly hear, is to allow new wine to be poured into old bottles. I like this way of speaking, by the way, much better than the retreading metaphor. The best place to pour the new wine into the old bottle is, I find, in the Vienna Woods, in the heurigen restaurants, where the display of a green branch on the facade, like a new Ph.D. diploma on the wall at home, signals to all that the new wine has come in. Another popular place for this exercise is France, particularly in Paris, as we are told by the cynical administrators who pass on sabbatical requests.

But our need to put new wine in old bottles goes beyond sabbaticals.

One does not need to be a cook to know when the soufflé is burned. One does not need to be a demographer these days to know that some of our students in some fields in some parts of our country are finding it devilish hard to find a job. It's clear that we in graduate education are a little like the M.D. who was said to specialize in diseases of the rich, but found himself in a recession.

We see smiles on the faces of departmental chairmen who now fill faculty posts without the need for extended Levantian haggling.

We note that some of our past Ph.D. graduates are reduced to accredited mendicity, to quote from Jacques Barzun.

We hear from a NASA spokesman that there are 40,000 unemployed engineers between San Diego and Seattle. The NASA computer facility in the northeast reduced staff by 250-300, of which 80-90 were Ph.D.'s.

We learn that the unemployed scientists in Washington, D. C. have banded together in an organization for their common good.

We hear that the National (AEC) laboratories are reducing their scientific personnel. In the case of Argonne, some 125 have been "let go" since last July and of these only some 30 have found jobs. Chemists are in over-supply, I hear. But more chemists are graduate deans than are any other breed; so seemingly they have successfully retreaded.

One could go on. On the other hand, the Ph.D. graduates from six northeastern land-grant universities have found places *paying salaries*, and yesterday the Dean from M.I.T. reported similarly from his institution.

So, it is difficult to determine exactly how great is the need for re-education. But, from anecdotal evidence, we do have a case of the academic bends as we go into a period of deflated opportunities.

In approaching the solution I'd like to turn once more to the wine analogy. Some wines improve with age. They should be left to ferment, their dregs to settle; and they should be sipped drop by drop and allowed to caress the tongue. A wine ought to be savored with the deep understanding of its place of origin in the Old World, where it gathered the sun and the dew and the miraculous fungi. I leave it to you to transfer the idea to our academic life.

Other wines are best imbibed soon after they are captured and bottled and should be consumed within two or three years. The bottles then are empty and ready for filling again, be it with a Mosel Doktor Bernkastel or a Chateau Haut Brion.

Perhaps we are unduly concerned about how to help the few or the many of our Ph.D.'s who are dislocated. But to them, this is a serious matter.

Should their re-preparation be a brief saunter through the cloister? Should we take sailors and make them into oceanographers? Should we expect Ph.D.'s to obtain another Ph.D.? To go again through Hades and out again?

One suggestion has been that we try to bring together these graduates and the colleges that do not have sufficient Ph.D.'s teaching there.

The magazine *Physics Today* suggests that at least some physicists should turn their talents to present-day problems of society. This idea is espoused by Henry Duckworth, a Canadian physicist, who has written a little poem about his leaving pure physics and going into applied research. It appeared in *Physics Today*, the trade journal of physicists, and is based on lines from Richard Lovelace.

Tell me not, Sweet, I am unkind
That from the nunnery
of thy chaste breast, and quiet mind,
To vacuum pump and telescope I fly.

True, a new mistress now I chase,
An I. B. M. computer;
And with a stronger faith embrace
A solid-state transducer.

Yet this inconstancy is such,
As you too shall adore;
I could not love thee Dear so much
Lov'd I not salary more.

I fear there is not much that graduate deans can do on an emergency basis to alleviate the employment situation. What would help would be better manpower studies of needs and more stable funding. So far as I know, there is no federal money available; and certainly there is no university money for sharpening the tools of Ph.D.'s.

We can, I suppose, influence new admissions and perhaps keep our new Ph.D.'s on as instructors for a time. And also, we can facilitate part-time study, whether for credit or non-credit. In doing this, the off-campus centers may be very helpful in that the refurbishing of our past graduates can often be done while they are holding another position and without causing them to move themselves and their families to a new location.

WORKSHOP ON GRADUATE ASSISTANTS, FELLOWS, AND TRAINEES—RIGHTS AND OBLIGATIONS

Elmer F. Baumer, Ohio State University

Ohio State has an active graduate student organization and union, the strength of which is unknown. The treatment of teaching assistants is crucial. These people are indispensable as a part of the way we do business. We do not tell the teaching assistant what he can expect from us, or what we expect of him. Appointment procedures are nonexistent. The teaching assistants realize their importance and the strength of their bargaining power. They are interested in knowing how stipends are determined and by whom, their position in respect to others on campus and on other campuses and with respect to assistant professors. They do not like risks; they want a period appointment. They demand a minimum of an annual appointment.

There are many unanswered questions: How many appointments can a student have? What rate of progress is he making as a teaching assistant? What effect does his being a teaching assistant have on his rate of progress in his degree work? What is the influence of the teaching assistant's work on his own future potential job market?

They want more explicit information on what is expected on them. In some departments, they do nothing. But most feel the requirements are unreasonable. We need to look at their assigned teaching, research, counseling, and committee responsibilities. They also raise questions regarding fringe benefits. They do not have bookstore benefits, insurance benefits, football-ticket benefits, or parking benefits. They are concerned about assistance with assignments. Some have been teaching the same course five years.

To meet these concerns, Dean Baumer recommends (1) establishment of regular-rising appointment procedures, having the student sign the agreement. This gives a chance to spell out the regulations. (2) setting up a graduate school committee, collecting meaningful data on stipends, setting up guidelines on teaching loads, (3) following AAUP regulations in respect to appointments and dismissals and fringe benefits. Assistants want a code of teaching responsibilities. The students do not want a detailed labor contract, but will demand it if we do not give them a more specific understanding of what is expected.

Ian Loram, The University of Wisconsin

Dean Loram gave a brief account of the formation of the union at Wisconsin and some of its attendant problems. The union began in 1968. At that time there were about 1800 assistants in the university, 1400 of whom were in the liberal arts college. The troubles began in 1968 when the union of teaching assistants was recognized. The matter was touched off primarily by a proposal of a legislator requiring the removal of the waiver of our of state fees, which amount to about $2,000. Stirred by this proposal, the students pressed for recognition of the union. An election was allowed to be held to see if a union was wanted. (Every effort was being made to avoid a strike.) Bargaining started in June 1969. In February 1970 no agreement has been reached; and the assistants voted to strike and, in fact, did hold a three-week strike. The university obtained an injunction and was allowed to take striking students off the payroll. Twenty-four students were taken to court, found guilty, and fined $250. A signed contract became effective this September.

Dean Loram illustrated some of the demands of the bargainers. For example, appointments were demanded for ten years or during the graduate career, whichever was longer. They actually got four years of support. In multi-section courses, they asked that the average section be 19, with a maximum of 24. They asked for a health package, but they got no health plan. One is now being worked out. All assistants wanted to be on a half-time basis. A student assistant evaluation committee composed of assistants which would tell the faculty if the assistant was competent was demanded. The faculty felt it should decide the competency of assistants, and this matter will have to be arbitrated.

Four items need to be bargained at the department level: the workload, the size of the class, the form of the student evaluation, and the content of the student evaluation. The contract is supposed to be re-negotiated annually. If the group strikes again, the university may not recognize the union; and the legislature may do away with teaching assistants.

Robert H. Wessel, University of Cincinnati

The University of Cincinnati is developing a charter of rights and responsibilities for graduate students. They have a graduate student association, but no union. The university has worked with the students in forming their organization. There have been cordial relations. The graduates and undergraduates together are developing a code of rights and responsibilities containing several articles. Article 1 essentially recognizes the student as a citizen whose rights and responsibilities as such are not to be abridged. Article 2 states that graduate students shall be on committees and that they shall have access to financial records. Requests to see these must be in writing, and ample justification must be given. Article 3 states grievance procedures.

In working out arrangements, graduate assistants are given an annual contract at the rate of $2700 per assistant; $800 is the minimum and $4000 is the maximum. The people at the University of Cincinnati are convinced that the old approach to dealing with graduate assistants is inherently defective. It is based on student enrollment. That is to say, the graduate assistant is brought to the university to perform services and the number of graduate assistants varies with the number of undergraduates to be taught. The university has tried to cut this relationship. The graduate assistant is provided added support for his educational development. All graduate assistants are assigned duties as appropriate. There are no teaching assistants, research assistants, or administrative assistants. There must be a surplus of assistants to operate this type of procedure with flexibility. They believe this is educationally right.

WORKSHOP ON GRADUATE STUDENT ORGANIZATION AND REPRESENTATIVES

Dean Harrison Shull began the workshop by proposing two areas for discussion: (1) Exchange of information and ideas concerning the graduate student's role in the governance system of the graduate school and (2) The functions of the Committee on Graduate Students Relations.

There was lively and clearly focused discussions on how graduate student interests are articulated and channeled into the policy formulation and decision-making processes of the graduate school and of the university. At present, graduate student interests are often articulated and coalesced through an organizational structure known as the Graduate Student Association. Its creation has been due to many impetuses coming from the administration, faculty, or students. The models which were presented at the workshop seem to suggest that on many campuses graduate student organizations are a new development and that they have come into being largely through administrative urging; the experiences of several graduate schools indicate that a constitutional convention is useful in hammering out a structural and functional design for a new Graduate Student Association.

Graduate student interests may be represented through formal membership on the Graduate Council or a similar body, with varying degrees of participation. Student representation ranges from token membership to equal voting strength in a tri-partite (administration, faculty, and student) composition. Several graduate deans, nevertheless, expressed the doubt that the Graduate Council is the real center of power, particularly in cases where graduate student representation is but a mere token.

A different organizational model was therefore discussed, that is, the decentralized and department-centered graduate student organizations. Whether these departmental organizations are then federated or not depends on the nature of the school and its leadership; the key issue is how much voice the students have in departmental decision-making.

The Graduate Student Association functions in various ways in affecting the policy formulation and decision-making processes. At one graduate school the Association meets regularly before each meeting of the Graduate Council to caucus on the Council's agenda in order to reach decisions to be followed by its representatives. At another, the student representatives are authorized to act, according to their own perception, in the interests of the graduate student body. In this latter case, a major concern would be one of communication between the leaders and the led.

Financially, the Graduate Student Association is supported in different ways. The most sophisticated practice provides for an official assessment of a fifty-cent fee per semester per student. The university collects the fees and turns the money over to the Graduate Student Association to be expended at its discretion, but this practice is not without its drawbacks.

Out of the discussion emerged two proposals for the Committee on Graduate Students Relations to work on:

(1) There is a deeply and widely felt need for some kind of exchange of information among the graduate schools as to what each is doing and how things are being done. A clearing house of some sort is evidently in order. The Graduate Student Associations have their clearing house (one at the University of Buffalo, for example), and, it was proposed that the ERIC Clearing House on Higher Education might be one channel of dissemination and that the inauguration of a journal by the Council of Graduate Schools might be another. There was considerable support for a journal. A practicable exchange could be easily organized by the CGS central office itself by serving as a depository for printed material proffered by individual graduate schools. A quarterly listing of abstracts of documents received could be sent to member institutions, which could then order copies of deposited material for a nominal fee.

(2) There is, furthermore, unanimous sentiment that workshops of this sort should continue to be an integral part of every program of the annual meeting of the Council of Graduate Schools in the United States.

WORKSHOP ON THE COSTS OF GRADUATE EDUCATION

Dean David R. Deener, Chairman of the Gradcost Committee, presided. Dean Joseph L. McCarthy, Director of the Gradcost Research group, discussed the background of the Gradcost study, its major purposes, and summarized progress to date. He pointed out that the study, financed by a grant from the National Science Foundation, consisted basically of an analysis of the literature on the subject looking toward identification and definition of the major elements of costs and benefits, and alternative procedures for allocating these.

Mr. Robert D. Lamson, project coordinator, then made a detailed presentation of the findings and analyses of the research group. The results of the literature search revealed that literature on the costs and benefits of graduate education divided approximately 70-30 between theoretical and practical applications. There is general agreement in the literature that higher education is an economic process in the broadest sense. A major problem is that of resource allocation both within and outside the institution. He discussed "benefits" in terms of private *versus* social benefits. On the cost side, which is a main focus of the project, graduate education is a joint process. This makes it difficult to identify cost inputs, particularly in terms of unit costs. More sophisticated information is needed with respect to incremental or marginal costs in contrast to average unit costs. Three methods for allocating indirect costs have been identified—the simplistic, the direct, and the recursive. The research group favors the recursive. Mr. Lamson presented a summary of some 26 unit-cost studies that have been completed by various academic institutions. These studies utilized a variety of units and techniques. with the result that comparing unit costs both between institutions and between disciplines on the basis of these studies is extremely difficult. The Gradcost research group had concluded that the major focus of its efforts should be on: (1) Qualitative identification of the major elements of total costs and benefits in graduate education. (2) Definitions of these elements. (3) Identification of the alternative procedures for allocating total costs within a framework which allows different methods to be compared and contrasted.

The Workshop was then opened to the floor for questions and discussion. The following points emerged as matters of concern:

1. The problems of incremental *versus* average cost including, for example, the additional cost in raising a master's program to a doctoral program in the same field.

2. The allocation of faculty time to graduate education *versus* allocation to other activities.

3. The allocation of research costs to graduate education *vis-à-vis* other activities, and

4. The feasibility of attempting to secure useful unit cost data from present studies in view of the inconsistencies in the cost studies performed to date.

Fourth Plenary Session: Volunteer Presentations

Thursday, December 3, 8:00 p.m.

Presiding: Stephen H. Spurr, *Chairman-Elect,*
Council of Graduate Schools

Harold P. Hansen, *University of Florida*
Edwin L. Lively, *University of Akron*
Trevor Colbourn, *University of New Hampshire*
Eric Rodgers, *University of Alabama*
Stephen E. Wiberley, *Rensselaer Polytechnic Institute*
Francis M. Boddy, *University of Minnesota*
Rocco E. Porreco, *Georgetown University*
Henry V. Bohm, *Wayne State University*
D. C. Spriestersbach, *University of Iowa*

Harold P. Hansen

THE PH.D. SURPLUS – REALITIES AND ILLUSIONS

At the risk of making you completely weary of the subject, I want to say a few more words about the Ph.D. surplus. My compulsion to talk isn't as great as it was before Dean Deener's talk this afternoon because I find that he and I share the non-popular, non-party line point of view.

I do not believe—and apparently Dean Deener doesn't either—that if we do good deeds and wait patiently for a while, our Golden Age will return.

As a physicist, I have been aware of the doctoral surplus problem early and acutely. Further, as a physicist, I was and am inclined toward believing what the numbers say. The numbers have a message, and it is that for many traditional disciplines the ball game has changed irrevocably, irreversibly, and irretrievably. We must play under a whole new set of ground rules.

Most of what we heard yesterday about the difficulty of detailed prediction because of the continued state of flux in academia is true, but it is immaterial. The significant transitions have already occurred, and they have been ponderously continuous.

The data indicates that about 40 percent of the babies born eighteen years ago start college. Further, the data indicate that about 1 percent of the babies born twenty-seven years ago are getting doctorates. The present doubling time of doctoral production is six years. Every six years we double the number of Ph.D.'s we are producing. My estimate is that the doctoral production rate will level off at not less then 6 percent of the adult population; we are now at 1 percent and rising.

People who wonder how this could be happening usually overlook the fact that whereas the student spends, say, four years on campus, the faculty member spends forty. This factor of ten produces the effect of faculty pileup.

If we made the completely irrational assumption that we are at equilibrium now, that is, the Ph.D. production rate levels off at the present 1 percent, and we keep roughly the present student to staff ratio in higher education with all teachers, administrators, support personnel having Ph.D.'s, our academics could retire after the standard forty years of service if no more master's degree people were hired.

Since seven or eight times as many master's are produced as Ph.D.'s, this might be a little hard on them. And remember, the junior colleges that are part of the market that I am speaking of might not want our Ph.D.'s unless they can have them at master's salaries. And they may not even want them then.

I judge that, in terms of keeping something of the present situation, a reasonable retirement time would be after ten or fifteen years of service. When the doctoral production rises to the minimum figure of 6 percent that I cited, we can retain our present retirement policies if Ph.D.'s teach every class of every grade down through kindergarten. Of course, this leaves slim pickings for the bachelor's recipients as well as the master's.

Now picture with me a plot, the demand for doctorates in higher education and the supply of these doctorates. The demand curve is the differential of a sigmoidal curve, so you produce a burst of need which rapidly tapers off because old faculty occasionally die but they never fade away.

But the supply curve, which reacted in response to the demand curve, built up momentum, and now, like the salt mill that folklore assures us lies at the bottom of the sea, the system continues to grind out more and more Ph.D.'s with inexorable persistence.

There is one other, perhaps melancholy, fact that was pointed out yesterday. The absolute birth rate itself is now decreasing. As a result of this, there are empty grammar schools at various places around this nation. Elementary school teachers are having a harder time finding jobs than our Ph.D.'s. In about five years we in the colleges will start to feel the effects of this, and by 1985 we will be getting 20 percent less freshmen enrollment than in 1975.

I guess it is sort of ironic that roughly the same date in history produced, through Sputnik, the stimulant to Ph.D. production and, through a pill, the depressant to population production.

Well, what I have given you are the salient demographic facts to live with. What can be done about them? Perhaps nothing. But we have got to try.

Actually ours is at least a partially self-correcting system, and I presume some personal adjustments are being made at this time. This doesn't diminish our responsibility to try to relieve the situation and to help to relieve it in such a fashion that will not deal a mortal blow to scholarship and to graduate education as we know it.

There are ugly possibilities, as Dean Deener indicated, that are raised by the conflicting demands of the Ph.D.'s for new positions, by the requirements of the disciplines for new blood, by the need to retain the services of those who are truly creative and productive, and by the prerequisites of people like us, the older faculty. It requires no great imagination to envisage economy-conscious regents and administrators dismissing resident faculty and replacing them by younger, cheaper, possibly better new applicants.

A five- or six-year academic career which fits within the AAUP tenure guidelines may become the standard. A man who is dropped by his school, through no real fault of his own, will find that no school is willing to pick him up. The requirement of fractional transfer of tenure-accruing years may have to be relaxed. In fact, the whole concept of tenure may have to be thought out and fought out again.

I am going to try to offer a few solutions, but before I offer you any of these, let me say a few words about non-solutions, things that won't work or won't make any difference, except in detail. One: Ending the Vietnam War won't make things any different. Two: Ending the administrative tight-money policy won't make things any different. Three: Stepping up or stepping down the space activities will have little overall effect. Four: Getting a different administration won't affect things. Five: Cutting the number of fellowships won't work. It only affected the top people anyway. Six: Offering a different doctoral degree will, if anything, produce more doctorates and really no more jobs. Seven: Giving more relevant doctoral training makes good academic sense, but it will not produce jobs or fewer doctorates for the academic arena. Eight: It would seem that we could bite the bullet and limit our enrollment. Some schools are doing so, but most of us won't. By and large, you and I are programmed for growth, and we understand no other concept. And if we or our successors do understand, we still have the phenomenon of the flood tide of Ph.D. students. It will have its minor ebbs and flows, but politics and economics make inevitable the proliferation of Ph.D. programs to accommodate the demand.

You and I will probably try to hold back this effect by taking in more students ourselves, but it won't work. What will work? As I said, probably nothing, because I see little that can prevent us from having, let's say, 6 percent of our adults getting the doctorate.

I will try to offer some palliatives, and there will be little in what I say that will carry any value judgments. We are in a moment of a crisis of a sort. Some of the solutions offered will not maintain our academic prerequisites to the extent that one would wish, but they may be quite necessary.

First and most obvious, of course, we must be absolutely honest with our students and ourselves about their prospects and their abilities. This may not do much good because the educational pattern that we have established gives the student little choice but to go on and on. But he must not be subjected to the cruel hoax of believing that his Ph.D. entitles him to a scholarly job or that his Ph.D. from an emerging university entitles him to any job at all. He had better be educated to believe that he is getting his doctor's degree because it is a very civilized thing to do.

There is a further problem. Suppose we are honest with the student and tell him what his chances are. The single-minded, mediocre student whom we reject will find some school that will accept him as a student. So the value in this first suggestion of honesty lies in the fact that we will feel better.

Now the most direct way of decreasing the number of potential teachers and increasing the number of jobs available to teachers is by letting the students go on to the labor markets less rapidly. This can be accomplished through three methods: (A) Extending the period of time for a student to get a Ph.D. This is in direct contrast to what is the usual policy, but it is a doubly effective procedure because it keeps more students in the classroom and there are fewer to go out looking for jobs. This may be contrary to the Carnegie Commisiion recommendation and many, many other recommendations, but I am talking about the practicalities of this particular problem. (B) The second thing that could be done is increase the number of post-doctoral programs. This is also doubly wise. First, it provides a part of the market for Ph.D.'s that is needed, and secondly, the professor with a research program would have someone to work with, which should assuage his need for graduate students. He could be more selective about whom he takes on as a student. (C) The third thing is creating a new and more advanced degree. This may or may not be concomitant with the previous proposal, but an S.D., the super doctorate, will let us start all over again.

Now this is about the only innovative thing that we could do that is within our power—but we won't. Why? Because we lack the super doctorates ourselves.

Now a third practical suggestion is the development of central controls. It may be an anathema to most of us, but it is certainly conceivable that to prevent chaos the government will select prospective Ph.D.'s, will select their disciplines, and will select the geographic area in which they will function.

The other mechanism of central control might be provided by faculty organizations. As much as many of us recoil at the thought, it may be necessary to really develop labor unions for professors instead of this game they are playing now.

Such an organization would be necessary, not so much for collective bargaining purposes but to introduce a measure of discipline in the profession. Even if unions of some strength do develop, there surely will be scab Ph.D. labor. This will have to be controlled.

On the other hand, one probably should not downgrade the collective bargaining function. The organization could play a central role in forcing a fresh and trenchant look at retirement policies. I have indicated that to create a dynamic stability, earlier retirement is indicated for the vast majority of our professors.

Reducing the figure by a few years will have little effect. I think that a retirement at the age of fifty would be a first order approximation to the right retirement age for a while.

Now the fourth suggestion I have is difficult. Over the years many foreign graduate students have been brought to this country, but now the scene has changed, and common sense dictates that we not import foreign graduate students unless we are certain they will return to their native land after they get their degree. This has not been the pattern.

Common sense also dictates that so far as post-doctoral positions are concerned, it would be preferable to use them for our indigenous, indigent Ph.D.'s unless there is some overriding reason for doing otherwise.

There is one realistic and obvious solution to the problem. It involves, of course, some money, but not a vast amount. The form of this obvious solution is this: We must have a W.P.A. for Ph.D.'s. The mechanism that this W.P.A. assistance would take would be through federally supported centers and institutes. The world already provides us with prototypes to emulate. In this country we have our government laboratories—they have been spotty in quality, but enough excellent work has been produced to show that under the right conditions and philosophy, scholarship can flourish.

In Europe some of the most distinguished scientists are found in institutes. The Max Planck Institute in Germany provides the home base for an elitist corps of scholars.

Within American academia we already have models that can be replicated. In the area of research, where the capital equipment cost is excessive, the government has established institutes at universities where this high cost research is carried out. Examples, of course, are SLAC at Stanford, the Forrestal Laboratory at Princeton, the Jet Propulsion Laboratory at Cal Tech.

This large, governmentally supported institute concept should be extended to the humanities and the social sciences. One can envisage a day—and not too far from now—when beside every million-volume library there will be institutes for the study of all manner of humanistic and sociological topics. These places would be centers of scholarship and would have all the research activities prerequisites and the programs of universities, except they should not be permitted to produce further Ph.D.'s.

Edwin L. Lively

DOCTORAL PROGRAMS IN NEW AND EMERGING INSTITUTIONS

Serious attention is being directed toward the increase in the number of universities offering or planning to offer doctoral degree programs. There are concomitant concerns about the number of degree programs that should exist in the several academic disciplines at the graduate level.

Interest is currently becoming intensified by changes in bases of financial support in supply-demand and placement factors, and in student selection of major fields.

The potential impact of these changes certainly justifies an increased surveillance and perhaps the establishment of guidelines and even restrictions on the creation, accreditation, and support of new doctoral programs.

Justification for new doctoral programs includes such diverse factors as: (1) The unique characteristics of disciplines and/or schools; (2) Local factors in student supply and demand; (3) Political considerations at local, state, and national levels; (4) An extant master's program of high quality; (5) A supportative role necessary for doctoral programs in related disciplines; (6) Probable trends in the evolution of society and its institutions on the basis of both short- and long-range projections; and (7) Past and present involvement in the doctoral level.

A modified version of the last point is the basis for several recent proposals to limit Ph.D. production to 50, 75, or perhaps 100 of the older, more prestigous institutions of higher education.

The thesis of this brief presentation is that historical justification alone is untenable for degree control because it accepts persistence in quantity and quality as fact, regardless of present and future events.

Within the range of factors, the historical, traditional one undoubtedly varies from school to school and discipline to discipline in its validity. To concentrate doctoral support and degree-granting approval within any specified number or list of universities has the potential of stifling the intellectual and creative aspects of the degree.

The vigorous competition and search for innovation among the programs in the newer and emerging institutions may well function more effectively than any other factor to prevent complacency and to encourage contemporary relevance in doctoral programs.

Certainly the limitations on resources—human, physical, and economic—are supportive of proposals to consider quantitative and qualitive controls on graduate degree programs. However, the assumption that quality can be achieved and maintained in all disciplines in any selected number of schools ignores the reality of competition for advantage among departments on an intra- as well as inter-university basis.

Comparing universities as a whole would unquestionably provide the basis for a ranking, assuming reasonably objective criteria could be agreed upon. But comparing universities discipline by discipline would show some drastic discrepancies, especially below the top ten or fifteen. It is no secret that many of the productive schools in total Ph.D.'s have some programs that are weak, if not dead.

Conversely, the emerging universities do have Ph.D.-granting departments that have received the leadership and support necessary to establish a high quality degree, although the pattern would be one of considerable variation for the aggregate of their programs.

The strongest programs in the newer and emerging schools are likely to be ones for which there is substantial local need and support. This is commensurate with the suggestion of President Rees in her opening remarks; namely, that institutions should specialize in that which they can do well.

The emerging university, frequently an urban university, is forced to face current trends long before the traditional school, partly because the latter has already resolved its identity crisis and partly because the former lives in the midst of its severest critics.

There are three possible consequences of degree restrictions on a historic-traditional basis that should be noted here.

One is the probability that the excluded schools would combine to establish their own associations and accrediting bodies, thus creating a schism in one of the major common denominators for quality.

It is also unlikely that politicians in the excluded areas would remain aloof from involvement, with political intrigue in the form of degree porkbarreling at the state and federal level coming to the fore.

Thirdly, the Ph.D. recipients from these institutions who could not find employment in one of the chosen few schools would be effectively denied participation in making their direct contributions to the next generation of doctoral students.

In conclusion, I would argue that the serious and broad scale ramifications of changes such as those proposed for degree program restrictions require far more intensive and extensive study than has taken place to the present.

When Dr. Arlt says that 73 percent of the doctoral students today are part-time, the conclusion seems evident that the impact of the emerging university that is most likely to serve the part-time student is already here. Thus within the next few years the list of degree-producing institutions may show some drastic revisions.

If there is skepticism about quality in the new and emerging institutions, I would point out that while their admission patterns may show some variations, new and emerging universities cannot afford failures in the end product. Their first few graduates establish their reputation and it is difficult to change thereafter.

Trevor Colbourn

THE ACE REPORT ON RATINGS OF GRADUATE PROGRAMS

A few weeks ago, in company with many in this audience, I received from the American Council on Education a so-called Graduate Faculty Evaluation Report. This immediately provoked some local reactions (a copy was also sent to the university presidents involved) and personal recollections of our first such "ratings" experience some six years ago. Many will recall the Cartter Report, also based upon a curious questionnaire, to which faculty found themselves making some curious answers. As a faculty member at that time I was concerned that such an exercise was taken with a certain seriousness in some quarters, and I am sure many recollect with some clarity and possibly dismay the ultimate results of the Cartter Report on graduate education.

In this context the document received recently from ACE occasioned greater dismay. It seems, to this innocent and possibly naive observer, quite extraordinary that having made one major blunder ACE would care to perpetrate the same blunder again. To be sure, I have heard vague assurances of efforts to correct some of the more serious deficiencies of the Cartter Report, but my efforts to identify the character of such improvement have not yet met success.

In my view the ACE rating was tragically misconceived at the outset. It appears to bespeak an attempted experiment that few social scientists would find meaningful or scientific. At best, as one colleague from a prestigious midwestern institution has remarked, it can be regarded as interesting and refined gossip. But unfortunately, the result of such an exercise is a publication that is taken with disarming seriousness by many persons of influence who just do not know better. The auspices of ACE carry weight. I do not mean to suggest that the National Science Foundation is about to regard the new publication as its Bible; I like to think NSF has confidence in its own judgment—along with the National Institutes of Health and administrators of the National Defense Education Act. But the same may not be said for the politicians and others to whom they and we are often accountable, and many will regard the new ratings with the same enthusiasm and trust accorded the Cartter Report. It is just too temptingly easy, convenient, and simple.

Certainly the basic character of the new rating seems strikingly similar to the first. That is to say, it is based upon a questionnaire distributed to select faculty (the method of selection is open to serious question) who were asked eighteen months ago to indicate their evaluation of up to 130 departments in their discipline. This approach does indeed seem to justify labeling the exercise as refined gossip; we all know the transient character of both reputations and faculty. Indeed, I well recall one colleague reporting earlier how he had thought to identify a specific department as outstanding in his discipline, only to discover prior to mailing the questionnaire that four crucial members in that department had just resigned, thus rendering his rating obsolete.

But there is surely little need to dwell upon the extraordinarily flawed character of this kind of evaluation. It is deplorable that this new report, like its predecessor, rests so heavily upon reputation rather than quality. There is no apparent informed attention to quality and character of programs, to facilities, to the products of such programs and their destination. In short, the procedure employed for this new report in no way measures up to the careful approach this audience would expect to take in either evaluating new program proposals or reviewing existing programs. We are instead confronted with a re-run of an ACE-sponsored feature which we could very easily live without, a re-run indeed to which legitimate exception could be taken on the first showing.

That this rating should emerge with the official blessing of ACE makes it the more lamentable and, of course, the more influential. It is surely ironic that the Council of Graduate Schools should, in this context, be an affiliate member of ACE, and that representatives of CGS should have been identified as consultants to the rating without (to my knowledge) having been consulted.

It would appear to many of us that graduate education hardly lacks problems today. In fact, we have done little but identify and discuss such problems at this Annual Meeting. It is deeply to be regretted that we seem to have lent our support to manufacturing further problems that can only exacerbate those with which we are already wrestling.

But I think the new rating by ACE may have one merit. It may serve to remind us that there is a demonstrable need for a careful evaluation of graduate education in the United States today. In my view, this represents a fundamental responsibility to be addressed by the Council of Graduate Schools. CGS can and should stand for graduate education in the broadest sense; it has a responsibility to itself and its constituency to examine its own house and consider the quality of its construction. Not that this will be easy—indeed it will not. But I do not think CGS can stand aside while ACE indulges in its own parlor games with graduate education. It is time for the Council of Graduate Schools to examine ways in which it might reappraise graduate education in an intelligent, reasoned, and careful fashion. Indeed I find it impossible to believe that CGS cannot do a better job than that to which we have managed to expose ourselves now, not once, but twice.

Eric Rodgers

Most of the remarks that I had in mind were made quite well by the last speaker. I shall, therefore, be very brief.

I am a physicist by training and was formerly active in research. It was satisfying to see something in print under my name if it could be defended against possible critics and could not be taken apart. I certainly would not be proud to have my name attached to this so-called rating report.

Most of you have gone on CGS visits to schools for the purpose of studying departments and expressing opinions concerning new programs under consideration. I went on one a couple of years ago after studying carefully extensive materials that the department furnished prior to the visit. I left home thinking that I knew what my recommendation would be. The two day visit caused me to change my mind completely concerning the department. When I met with the other visitor at the end of the second day, his first remark was, "I have changed my mind completely since my arrival."

I tell this to emphasize my contention that it is impossible to rate a department with any validity whatever unless the rater has made a recent visit to the department. There are so many things, and the last speaker mentioned a number of them, that one does not get from reading materials that may be available. I'm afraid that most of the ratings in the ACE report were made without even the help of written materials.

I am all for honest and meaningful criticism of our departments and programs. We have been inviting outside consultants with increasing frequency to study existing programs and suggest ways that we may improve them. Except for the cost, we would have consultants look at all of our graduate programs at least once every five years. We are, therefore, all for ratings if they mean anything.

Now I want to close by mentioning a story from the Book of Job. Job himself was being rated by some religious leader of his day. He had had his troubles, and the leaders were telling him about his shortcomings and telling him how he brought on his troubles. Then the 38th Chapter of Job begins with this response to Job's raters:

> Then the Lord answered Job out of the
> whirlwind, and said, Who is this that
> darkeneth counsel by words without knowledge?

Stephen E. Wiberley

I think when I addressed this Council a few years ago I commented on the Cartter report; and as I recall, the remarks were to the effect that it didn't prove to me—and I can say this knowing Dean Elder will be in agreement—that Harvard wasn't number one. All it proved to me was that dog bites dean is not news, but dean bites dog is. And I think we certainly all felt the report was at least ten years behind the times.

And when I got this letter from the American Council on Education, I was hopeful that the new study would be on a much broader base and do a reasonable job. I suggested in a letter to the members of the committee that they should look at several emerging new fields. I wrote a long letter to this effect; I carbon-copied every member of the committee, and I never received a reply to my suggestions.

We received the relative ratings of our own departments. In my judgement, as graduate dean, they do not make much sense. I discussed with several other graduate deans here this evening their relative ratings, and they made the same assessment. I think we graduate deans have a little bit of a feeling for the merit of our own programs. I have heard from other reports that several programs were actually given numerical ratings for which the schools don't even give degrees.

A few years ago the American Chemical Society decided to look at graduate education. As you know, they accredit the four-year baccalaureate programs. They made extensive visits to many schools with the idea they would probably accredit Ph.D. programs. After making the study, what did they do? They left this hot potato alone. I am sorry they did leave it alone. But all it proves to me is that "fools rush in where angels fear to tread."

In my judgement I think it unwise to publish this report with the blessing of the Council of Graduate Schools and would hope at its meeting tomorrow this Council would support a resolution to withdraw its support.

Francis M. Boddy

Since both of the people developing these reports were economists and friends of mine, I think I must stand to defend the basic principle of the reports.

The Roose (and earlier Cartter) report never pretended to be anything except reputational evaluations. Every one of us in this room has been asked, "What do you think about the faculty or Ph.D. program at *X* University"? This is the only time that such information has been pulled together in such an organized fashion. Like all surveys of opinion, there are all sorts of ways in which various people could suggest it could have been done better.

Alan Cartter was really not very sold on the whole idea, but the more he looked into it, the more intrigued he was by it. And if you will read carefully through the '65 report you will find that the correlations run very high between the overall reputation for quality and opinions or objective measures of quality that might be used such as publication, library facilities, and so on.

The second point is that reputations of departments were being circulated and are being circulated in Washington and elsewhere on the basis of what might be called a minimal amount of hard evidence.

So I would say, suppose you were faced with the problem? How would you try and get a consensus of the most expert people in the community with respect to reputational standing? That's all it pretends to be, reputational standing of Ph.D. departments and programs in the United States.

First, would you make it a general Gallup Poll? The answer, obviously not. What would you do? You ask the people who presumably are best informed. Who are they? They are, first of all, the senior scholars in the field; secondly, they are the department chairmen; and thirdly, they are people that have recently been through the program, recent Ph.D.'s.

You would survey these people by taking a list of the Ph.D.-producing departments from the best information source, which is the Office of Education. They make mistakes. Errors are inevitable. If you will look at the percentage of error, however, I think you will be surprised how small they are.

One great difficulty with these studies is that they surveyed in the first program twenty-nine fields, and in this latest, thirty-six. My institution has seventy-some fields for the Ph.D.'s, and many of you give Ph.D.'s in areas which don't quite match or are outside the surveyed fields. You have perfectly legitimate complaints, as the original Cartter report pointed out. For instance, in the field of biology it sometimes is hard to define the field and therefore get a comparable rating.

Nevertheless, I don't think you can attack either the honesty or the intent of these surveys. All you can attack is the difficulty of the problem of rating quality and the difficulty of arriving at any kind of numerical measure which will be generally accepted. And I guess the only answer to it is the old Bruce Bairnsfather cartoon, which I remember as a young child in Canada, coming out of World War I: "If you know a better hole, go to it."

I think I can say that this study was not a matter of life and death for Kenneth Roose. This was a chore that was passed on to him because the original report said these things inevitably have to be done again. You can't let stand engraved in stone, or on paper, or in peoples' recollections, the reputation of a department as of the spring of 1964.

So they reproduced it in 1969. It was carefully done. Dr. Roose himself has grave reservations; and you may note that he is not publishing the scores of the upper two levels, when you see the final report. You individually got reports on your own department; you will not find those details listed in the final report, only the rankings.

He was also a little unhappy about the setting of a deadline which made a difference between 4.01 and 3.99, distinguished versus strong, and so he combined these top two groups to de-emphasize this cutting edge.

But the most devastating feature of this report is that in field by field there are a large number of established—not only newly established, but old established—institutions that, in the eyes of their own brethren in the profession, have fields that rate less than adequate in terms of their faculty and less than satisfactory in terms of their graduate programs.

One of the strongest statements that you will find in the report, which I completely agree with, is that every institution, old as well as new, must seriously look at the reputational standing.

In response to the "fact" that the reputation of a department depends on old information, I note that in my own field of economics, a very distinguished institution just a year and a half or so before the 1964 survey, lost a substantial number of its distinguished group. Its ratings reflected that practically immediately.

All the studies of cross validation, up-to-dateness, and so on indicate that in spite of the difficulties—and it is the difficulties, not the errors that I am talking about—these two reports of the reputational standing of both departments and programs in the United States, were expertly done and the results reliable.

So I think you ought to ask very seriously the question, if you are thinking of supporting a resolution denouncing this kind of operation, "What are the implications of this"?

One is, such surveys shouldn't be done. Reputations should depend upon incidental rumors, anecdotal comments, whom you talked to last.

The second one is, the job is too difficult, so it can't be done at all well, no matter how carefully it is done. But I think if you read carefully, particularly the first report where the validation studies were made, the segments of the populations that were voting, and the agreements among them, you may agree that it can be done well. In my own field, for example, they not only sampled the standard groups, but they asked the American Economic Association to set up a panel of eight or nine experts, old hands, wise men in the profession. And, again, the validation stood up.

So I think you are talking, when you criticize the report, of a very well-done job on a very difficult problem. And I would like to sort out the kinds of comments that are being made about the report in two categories. One is it shouldn't be done, and the other is, if it is going to be, it ought to be done in the best possible way.

The first one I can't respond to except to suggest that if you don't do it this way, it is being done in other ways, and on the basis of much worse, much more localized, much more personal kinds of information, not public information.

The second aspect of it is that it is *public* information. And as public information, of course, it ought to be criticized.

You may remember, if you were in the Chicago area, the long articles in the Chicago Tribune in which Chicago reacted strongly toward their reported standing in that first survey, in spite of the fact that they stood out in the United States in most of their departments among the major institutions.

So think carefully before you denounce this operation. Reputational assessments are being made by graduate students, by their professors, by department chairmen advising students. It is being done in Washington with respect to which are the strong institutions that ought to be supported, or which are the institutions to be supported in particular areas and fields.

My own feeling about this is that I think it is unfortunate that only thirty-six fields were covered, and that only Ph.D. programs were judged. But in the nature of the case, I think it is understandable.

So I would argue, as an economist and as at least a part-time statistician, that (a) you should not denounce the people for the selection of the information that they were trying to assemble, the problem they were looking at; and (b) that any denunciations or criticisms should be in terms of specifics as to what went wrong or how it ought to have been done differently and better.

How many of you at the end of the last Cartter report, when such suggestions were made, actually wrote to the ACE and said, "The next time why don't you do it this way instead"?

I am always afraid of criticisms that come out after the fact. The first report outlined very clearly exactly what the procedures were; recommended very strongly that a duplication of this survey be made some five years later. A year and a half or two years ago the ACE announced they were going to do it; preliminary information was sent around to all of you; graduate deans were involved in selecting the panels that made the judgments. It is your own people that made these judgments.

I think it would be in somewhat bad taste to act emotionally on the basis of the results of your particular institution's standing, or because the very valid criticisms you may have with respect to the reputational standings of particular programs as you see them, differ from the report.

I would suggest very strongly that such evaluation is long overdue in the United States, and I would hope our comments would be how to make it better, how to put caveats on the interpretations of it. Roose, you will notice, did not carry the scores out to the third decimal point this time; he only carried them to two, rather than three. That is at least a factor of ten better.

All I am suggesting is that it was an honest job, very carefully done, and the reputation of the departments *is* the reputation of the departments as measured by the best techniques we have available to us.

Like all attempts, it is only a partial success. And I think one criticism is, Should it ever have been done at all? And that, I think, is a quite different question to debate.

Trevor Colbourn

It seemed to me that Dean Boddy misinterpreted the flavor of my remarks and possibly that of some associates.

I don't believe there was any slur intended with regard to the integrity of either Alan Cartter of Kenneth Roose. I think, rather, the concern is with the basic value of a narrowly focused study on reputation which is so unfortunately regarded as much, much more by many, many people.

Certainly, as you say, it is an extraordinarily complicated and difficult task and one which, regrettably, nobody seems to have seen fit to attempt a major and adequate response.

My personal feeling is that it is imperative that this organization consider its responsibility in this area and attempt to meet it.

Rocco E. Porreco

THE POSITION OF THE GRADUATE DEAN IN TIME OF AN AUSTERITY BUDGET

First of all, I apologize for bringing up a topic which has been discussed at countless meetings of graduate deans and which is a constantly recurring theme in the literature of graduate education. It has also been raised at this Conference by a number of speakers in several different ways. And I apologize to several of my colleagues here who have listened patiently to my privately rendered passionate and pessimistic perorations on this topic.

I want to make it clear that I am fully aware of the existence of happy graduate deans, those who are fully satisfied that they have all the power or authority they need to carry out the responsibilities of their position. I also wish to say that you should not infer that I am an unhappy dean. My president was himself a graduate dean for many years and has written most perceptively and with great insight about the structure of the graduate school within the university and the necessity of having the kind of model that gives the graduate dean the authority necessary to carry out his responsibilities. I wish also to make it clear that I do not argue that there should be graduate deans in every university or that those who be should endure. Certainly graduate deans are not indispensable to graduate education, and the Council of Graduate Schools itself may indeed pass out of existence before the end of this decade.

I speak tentatively and inquiringly and about those institutions which now have graduate schools and graduate deans who have been given the primary responsibility of maintaining and improving the quality of graduate education. In these institutions, the dean has been described as a lonely figure, faced on one side by a number of vice-presidents and undergraduate deans and on the other by the departmental chairmen and their baronies. It has been pointed out that there is usually only one graduate dean in an institution. Often being a floater in the table of organization and lacking statutes which clearly describe his position, and without authority, faculty, or budget, he has had to operate "either through the influence of his charismatic personality and intellectual distinction or simply by patience and low cunning—or so says the literature of graduate education. Unfortunately many new graduate deans believe this.

At the other end of the spectrum, some who have seen the growing strength of the departments and recognize the anomalous position of the graduate dean have recommended that he become variously a vice-president, a vice-provost, vice-chancellor, or what have you. Whatever the solution to this may be, I feel that it will be different for each university. I think that it is most necessary for us, however, to reflect on the special problems that the kind of dean I have described will face in a period of austerity.

I think there is little doubt that the immediate future which we have heard described somewhat pessimistically at this meeting will call for strong leadership from the graduate deans. I suppose the principle is that in good times we can get along with weak graduate deans, but that to try to do so in bad times has special dangers—as well as opportunities, of course.

Some of the developments and tendencies that I see arising in connection with this austerity situation are: (1) An overreaction to the Ph.D. pinch or glut or whatever it is such that graduate programs are being indiscriminately condemned for producing unemployables. (2) The development of university budget committees without decanal and with little faculty participation. (3) As more emphasis is placed on undergraduate education, graduate schools being hard pressed to hold their own or, what may be more appropriate, to stage an orderly retreat. (4) The departmental structure which is, or has been, the basis of graduate education as it now exists being weakened by increasing emphasis on undergraduate schools and their programs. (5) As officers of institutional research develop and become more sophisticated and more emphasis is placed on systems analysis and cost accounting, a stronger pressure on graduate schools to justify programs, especially in the natural sciences, where there are large research components.

As indications of things to come and which are already here, we have all heard the complaints of undergraduate students that they are paying the cost of graduate education and being cheated in the process. We have heard the criticisms, sometimes within our own institutions, that our faculty does not do enough teaching and spends much of their time in useless research.

I predict that we will hear these criticisms more and more. We are in a time when retrenchment is obviously necessary. And being a kind of retreat, it is much more difficult than building and attacking. I hope, as graduate deans, we will be able to assist in this retrenchment and to heal some of the wounds that it will cause. In order to do this, however, our position will have to be strengthened, and I think it inevitably will.

Let us hope that we will not, however, be drawn to the bosom of the higher administration as hatchet men, but as experts who know about graduate education in our institutions and can best give it the greater flexibility and new directions that it will most surely need. If this hope is not to be realized, then I predict that the dean without a charismatic personality will not survive.

Henry V. Bohm

FACULTY UNIONIZATION

I want to draw your attention to the possibilities or, perhaps, the probabilities of some unionization in some faculties. I am not talking of teaching assistants, who received some attention in one of the sessions this afternoon, although I think that process may be simultaneous or even precedent to faculty unionization.

I am focusing on regular faculty members. It is necessary to mention not only the American Federation of Teachers or the Teamsters or the National Education Association, but also the American Association of University Professors, which is, in fact, already the bargaining agent at a few schools.

Dean Deener this afternoon spoke about faculty economic security; I don't want to spend very much time on that aspect of the topic, particularly since Dr. Hansen pre-empted some of my thunder earlier this evening. But let me just say in terms of economic security that the state legislatures of many states these days are not terribly generous. Further, many private institutions are operating at a deficit. Thus faculty salaries, which are a primary consideration, are not going up as rapidly as they have in the recent past, as rapidly as faculties have easily become accustomed to, as they would like to become accustomed to, or, perhaps, as they ought to be accustomed to.

Now, Michigan is certainly a state where unions are politically strong. We may be ahead of many other states in facing the possibility of faculty unionization, and it may well be that I am drawing this upcoming problem to your attention too early in that sense. But at practically all of the state universities in Michigan, already the non-academic employees are unionized, mostly in locals of various national unions. These unions in some cases are getting "better settlements," that is, higher percentage compensation adjustments than the faculty. The argument that these non-academic employees start from a lower salary base than do professors is not well received since in terms of percentage salary increases these employees are, in certain cases, doing better than the faculty.

At Wayne State University this was certainly true this past year, and the point was driven home rather strongly to our faculty. Their average salary increases this past summer were approximately 6 to 6½ percent. Certain groups of non-academic unionized employees received more, and this fall the General Motors UAW settlement is about double that, i.e., 12 to 14 percent.

Another possible incentive for non-tenured faculty members to consider unionization follows. Non-tenured faculty members whose contracts are not being renewed are in some cases at some universities demanding hearings, demanding specific reasons, demanding specific justification for non-renewal of contracts. At least in the State of Wisconsin, I think, non-tenured faculty are receiving some support for such demands from the state courts. A demand of this type is a kind of "working condition" which is of interest to a unionized faculty and which is negotiable at the bargaining table.

I certainly don't have answers. At this time I just want to draw this problem briefly to your attention. I think it impinges on some of the problems that have been discussed here during this meeting.

Let me post a couple of questions to you. They are by no means exhaustive of the topic. (1) What is the effect on graduate education of a unionized faculty working with at least a partially unionized graduate student body? I am thinking here, for example, about assistants. How do you work out these relationships? (2) How do you build into union contracts safeguards for creativity, originality, scholarship, excellence, all of which, I believe, are at least in part the basis for graduate education?

Stephen H. Spurr

I would like to add, if I may very quickly, a related topic, because it is one which you will find cited, I think, in last week's *Science* magazine. As you may know, the University of Michigan, which I represent, is engaged in discussions in the Civil Rights Division of the Department of Health, Education, and Welfare on discriminatory practices, *vis-à-vis* women. There is one element there that I think is of very great relevance to graduate education. There is no great disagreement on the non-discrimination policy, but one of the bones of contention is the claim of the Civil Rights Division that since they have the right to regulate employment policy and since many of our graduate students are employed, they have the right to regulate graduate admissions. I have personally taken a very strong stand that this is none of their damn business and, as a matter of fact, would be an extremely serious matter if any agencies concerned with employment practices asserted jurisdiction over graduate admissions policies.

I think this is one that you may want to watch as we, I think, are a test case.

D. C. Spriestersbach

THE PLACE OF THE DISSERTATION IN THE TRAINING OF GRADUATE STUDENTS

Since we are spending time in self-analysis and since no one has spoken directly to the issue of the place of the dissertation in the training of graduate students, I suggested to Dean Spurr that it might be provocative for me to comment on that subject by abstracting a paper that I gave a year ago to the Council on Research and Research Administration of the National Association of State Universities and Land Grant Colleges entitled "Servant or Master." In doing so, I will omit many of the citations of the critics of the dissertation, but I am sure that all of you know that these critics exist.

I would like to make one further comment before presenting portions of the paper. I want to emphasize that I am not challenging the definition of the Ph.D. as a research degree. For the purpose of this discussion, I chose not to debate the need and propriety of making the degree something more than solely a research degree. Instead, I wish to focus attention on one of the most costly aspects of the training of the candidate for the degree, namely the dissertation requirement. In doing so, it is not my intention to offer any suggestion that we lower our standards for the degree one whit; rather, it is my purpose to suggest some changes in the degree program which may make it more effective than at present in achieving the stated objectives for the degree.

With this explanatory prologue, let me read a few excerpts from the paper.

First, let's review briefly what the "Establishment" has said about the place of research in the Ph.D. program. The Council of Graduate Schools describes the Ph.D. degree as "the mark of highest achievement in preparation for creative scholarship and research, often in association with a carreer in teaching at a university or a college. The Doctor of Philosophy shall be open as a research degree in all fields of learning, pure and applied."

The Council goes on to say: "An aspirant or candidate for the Doctor of Philosophy degree conducts research under the guidance and supervision of a member of the graduate faculty or a committee. As this collaboration proceeds, he gains in experience and ability to conduct independent creative research. When the student completes research that is a significant contribution to knowledge, it is presented in clear and precise English as his dissertation."

The assumption is made that the second statement properly follows the first, namely that "preparation for creative scholarship and research" is achieved, at least in part, by having the student complete "research that is a significant contribution to knowledge."

In the comments that follow, I shall examine the premises on which these statements are based, our success in achieving our objective, and make some suggestions for future deliberation and, I hope, future action.

The conduct of research in graduate programs seems to be based on the reasonable principle that the student learns by doing. First, he must familiarize himself with a body of knowledge. He reacts to the material by evaluating the processes by which it was developed. He makes judgments about the significance of the knowledge in terms of its relevance to current issues. As a result of this review he determines that a particular issue deserves further study.

He proceeds to develop a design for studying the issue, makes the appropriate observations, evaluates the data resulting from these observations, and draws conclusions from the observations that, it is to be hoped, result in the significant revision or refinement of current understanding of the issue.

As a result of this experience he presumably learns how to evaluate data, how to design studies to create new data, how to state the issue precisely, and how to limit his observations to the issue.

We say that he has learned to become a disciplined scholar, capable of working independently to generate new data and capable of discriminating fact from fiction and significant facts from insignificant facts.

It is a bit humbling to be reminded that such purposes were not always those advanced for doing the thesis. Engel reminds us that the thesis served in the 13th and 14th centuries as a means of evaluating prospective teachers. She goes on to say: "In none of these meanings of 'thesis' is there a trace of the assumption that the thesis experience ought to contribute to the education of the student or that it ought to result in an original contribution to a body of knowledge.

"For centuries 'thesis' meant some kind of public performance, either a ceremony or an examination or both."

It wasn't until after the scientific revolution that German universities began to implement the Helmholz version that "every student should add at least one brick to the ever-growing temple of knowledge." Some hundred years later we are still using the Helmholzian justification for the thesis, though there are indications that not all of us believe what we are saying.

Berelson's survey documents the steady erosion of the thesis requirement for the master's degree and the dissatisfaction with the dissertation for the Ph.D. among faculties, particularly in the humanities, social sciences, and education. The redefinition of the dissertation, from a significant contribution to knowledge to an experience in writing a major research paper, is to be seen in the requirements for the Doctor of Education and the Doctor of Arts. Further, the press for relevance and for cost analysis, input versus output, has put the dissertation under increasing scrutiny.

A professor of Romance languages observed: "With the emphasis upon the magnum opus directly, the whole course of the student is subordinated and sometimes sacrificed as a result. Graduate work leading to the doctorate notoriously stimulates but a small proportion of students to live an active, eager, fertile, intellectual life afterwards.

"If this is true, we stand condemned as sterile in our influence and training. To stimulate capacity for original creative work, departments demand first truly terrifying amounts of exact knowledge. It has never been shown why the second of these considerations leads to the first. Intellectual work should be a delight, not a torture or a terror."

Flexner provides some common sense perspective to the discussion by observing that the end of education is "to be able to do what you've never done before." He notes that "From the standpoint of practical need, society requires of its leaders not so much specifically trained competency at the moment as the mastery of experience, an interest in problems, dexterity in finding one's way, disciplined capacity to put forth effort." And finally he observes that the thesis is a "a good servant, but a bad master."

It is an understatement to observe that there is much room for improvement in our rationalization of the places of research in the education of our graduate students. That it is so is more than surprising; it is a serious indictment of those of us in leadership-positions in graduate education. As scholars in our own fields, we are familiar with criterion measures and the processes of validation. However, we fail to apply them to the educational processes for which we have responsibility. In the recent past we have been preoccupied with designing new packaging and new names for the same old products, and the clamor of our critics is mounting.

Faculties to the contrary, our publics are probing our input-output ratios, our admission policies and attrition rates, the nature and needs of the public we purport to serve, and our effectiveness in serving them.

When we are asked about the latter, we are apt to act incredulously. Surely our job is to teach and do research. We don't have time to follow up on our graduates to see how they are doing. And anyway, nobody is going to tell us how we should teach our students. We are the teachers; what do they know about teaching? Academic freedom will be breached if we let these carpetbaggers tell us what to do. And with haughty disdain we slough off our critics and proceed to reproduce ourselves—in our own image, of course.

Since people who live in glass houses shouldn't cast stones, it is only fair that I offer a couple of suggestions.

First, let's once and for all bury the notion that the dissertation must represent a significant contribution to knowledge. We know that it has often not been so in the past. Let's have the honesty to admit it. Instead, let's view the dissertation as one of the assignments by which the student comes face-to-face with the messy and very human business we call "research." Let's view the experience as preparation of the student for a life of critical review, aimed at regeneration, adaptation, and growth.

I should like to make clear at this point that I am not saying that there have been no dissertations that have made significant contributions to knowledge, nor am I predicting that none will be made in the future. If we accept my reformulation of our objective, we will applaud when someone hits the jackpot, giving us an unexpected bonus.

Second, let's mount a concerted, joint effort to validate the place of the research experience in our various degree programs. Let's stop the condescending smiles and shrugs when it is proposed that we identify our criterion measures. Let's identify them and follow through with appropriately designed studies aimed at providing us the feedback necessary to review our present models of educational programs and to revise them when indicated, even to the extent of agreeing in advance to eliminate the dissertation, as presently defined, in those instances where performance fails to justify effort.

It seems inescapable that we will decide either to allow several educational tracks under the same degree umbrella or distinct degree programs for different levels of research and creative activity.

Third: To the extent that we retain the formal dissertation requirement, let's do more than give lip service to the importance of the adviser. If, under the new definition of the purpose of the dissertation, the student is no longer expected to develop a proposal for an orginial contribution to knowledge, frequently on his own, we will need to approach the identification of the student's research project with the same involvement that we have when we introduce him into any new body of knowledge. Accordingly, we will have to recognize that this advising is time-consuming, and we will have to develop accounting systems that will take the hours spent in this activity duly into account when we develop data on academic loads.

Fourth: Consistent with these policies, let's pay particular attention to the difference between disciplines when we plan to train students in the critical review of existing materials in their fields. The significant creativity of the physicist is revealed when he formulates the questions to be investigated by appropriately designed experiments. This is an act that involves judgment. Certainly it is not a quantitative act or one dependent on machines. Why then should we press so hard to make our students in the humanities, social sciences, and the arts slaves to objective documentation? In a very real sense, the critical essay or the defense of a new insight or a new perspective of existing facts is a far greater test of the scholastic mettle of the student than the highly structured, mechanistic accumulation of data which follows the statement of the problem and which is assumed to be the hallmark and essence of creative scientific work.

And finally, let's be consistent and thorough in our follow-through of our feedback data by designing models that are consistent with our criteria, even if this means that many of the established and venerable practices of graduate education are altered or abandoned.

As Ness has suggested, "If we discard the polite fiction that the dissertation is an original contribution to the sum of human knowledge in favor of its being an indicator of scholarly competence and promise, then there is some reason for its being undertaken at the inception of graduate study rather than its culmination."

In summary, I am urging that the dissertation be the servant, rather than the master.

Fifth Plenary Session

Friday, December 4, 8:30 a.m.

Presiding: Alvin H. Proctor, *Past Chairman, Council of Graduate Schools*

Lloyd Humphreys, *National Science Foundation*
Robert E. Wolverton, *Miami University*

Lloyd Humphries

THE ROLE OF THE NATIONAL SCIENCE FOUNDATION IN GRADUATE EDUCATION

I have relatively little firm information about either the '71 or the '72 budget figures for the National Science Foundation. We do not as yet have an appropriation for fiscal '71, which, of course, started last July. The bill that was vetoed by the President contained 511 million dollars for the National Science Foundation, plus 2 million dollars in foreign currencies.

It is my understanding that this same amount is very likely to be passed by the Congress again when they get around to considering a new bill for the President's signature.

The President's budget for 1971, which went forward almost a year ago, did not contain any money for new starts in generalized traineeships, the type of traineeships that you have been used to over the past several years.

The Congress did put in 9.5 million dollars for traineeships. But the one firm thing that I can tell you this morning is that even if this is passed again in the form that went forward from the Congress the first time, the Office of Management and Budget will not allow us to spend 9.5 million, or anything like it, for generalized traineeships. Generalized traineeships are, as far as I can see, completely dead for the foreseeable future.

The 511 million dollars for the Foundation as a whole will include some modest degree of increase for research support, which I am sure you are very much interested in, for which, however, I have no responsibility.

It does include also some money for fellowships; it includes some money for other graduate education projects, curriculum projects, and special projects in graduate education, though in very limited amounts.

We are proposing to spend some of the money allocated for traineeships by the Congress for categorical traineeships that will support training in areas of urgent social need. We have had no word as yet from the Office of Management and Budget concerning their disposition of this proposal. But I shall say more later about what the categories might be and our definition of "urgent social need."

We are also proposing some administrative changes in fellowships and traineeships, if we have them. We are proposing an increase in stipends, and we are proposing an increase, a modest increase, in the cost of educational allowance. Since you are particularly interested in this, it will be from $2500 to $3000.

We are abolishing dependency allowances. (Contrary to the statement made Wednesday afternoon by a member of this group, I am for sin and against motherhood.)

Actually we are putting the dependency matter on your backs. Universities will still be allowed to supplement traineeships, if we have them, or fellowship stipends, and the determination of need can be made locally. There were other reasons, by the way, for abolishing the dependency allowances; they were difficult to administer.

We are also proposing a change in the tenure of fellowships and in the number of years of support of traineeships. The Fellow will be required to start his fellowship the succeeding year after it is awarded. He can then take the remaining two years of his fellowship at any time in the succeeding four years—a total of five years in which to have three years of fellowship support.

Trainees will be supported 100 percent, whatever that figure may be, the first year; two-thirds of that amount will be allocated for second-year traineeships; and one-third for third-year traineeships.

We are also proposing a single initial screening of Fellows, with a subsequent screening to be done at the university level. This has come under some degree of attack, I understand. None of these are absolutely certain at this present period of time. If you have any ideas along these lines, please let us know.

We have found that there were relatively few changes in the evaluations of fellowship candidates as a result of a second screening, and it seemed to be an expensive operation in terms of what little gain was being attained.

Now, to talk about more general matters and how we approach the matter of social need. I remind you in the first place that education is an exceedingly costly enterprise. I have seen a recent figure indicating that about 10 percent of our Gross National Product supports education at all levels and in all locations. I don't think that any proposal to increase the number of years in graduate training, as was suggested last evening, is going to be a viable proposal. Somehow we are going to have to cut the cost of education rather than increase it.

Our educational costs are high because we are educating a larger proportion of our population at all levels than any other country in the world. One reason why the Soviet Union can spend more money on research, relatively speaking, is that they are not spending nearly as much money on education.

Almost 100 percent of our population enters high school; very close to 100 percent, something like 80 percent, is now finishing. More than half of this group will enter college, and so on down the line. I do not believe that the picture painted last night by the first speaker is overdrawn. We are overproducing Ph.D.'s., but I would like to point out that we are also overproducing B.A.'s. from liberal arts colleges, and we are overproducing, in my opinion, high school graduates who come up through the college preparatory program.

We are doing this, it seems to me, because we have a single hierarchy of occupational values and occupational prestige. And both of these are related to one segment of human ability, the verbal-intellectual ability.

I suggest that we ought to take a look at this hierarchy and try to set up additional hierarchies of prestige that are, in my opinion, badly needed in our society. Let's take a look at social need.

We have a highly complex technological society. Bachelor-degree people in the liberal arts who are unable to find jobs in high school teaching are not going to keep a technological society running, nor are they going to be able to solve some of the environmental problems that we face today. As a matter of fact, the mechanical abilities are, in many ways, more important than the verbal abilities for a society such as ours.

In a sub-society, a highly complex one such as the Air Force, where I worked for a number of years and where I have a good deal of information about jobs and the human abilities that are related to them, high verbal ability people were a dime a dozen. You had to look hard in order to find good spots to classify them in. You put some of them out as chaplains' assistants and other jobs of that sort, but they weren't really critical for the operation of the society.

The dirty-hands and the clean-hands mechanics were much the scarcer and much the more critical. In addition to mechanical, I think there are other dimensions that are absolutely required by a complex society for which the educational patterns are different from the traditional higher education patterns and the traditional college prep patterns and that we had better spend some time looking for these and trying to train for them, to educate for them, and to try to build up their prestige to make them more attractive.

I'm saying this, incidentally, not in a class-oriented sense. The kinds of people who will make good mechanics are also found among our children as well as among the children of working-class parents. As a matter of fact, a good many middle-class children ought to be going into mechanical and other kinds of useful training right now rather than into traditional higher education.

I base this statement in part upon the needs of the students themselves, as I see them, needs in terms of patterns of abilities and needs in terms of patterns of interests and values.

I am not suggesting that these other kinds of education or training be devoid of the liberal arts, but I do suggest that occupational training as the focus, with the traditional liberal arts subjects in the periphery, is likely to lead to better appreciation and more learning of the traditional liberal arts subjects than trying to put everyone through an educational curriculum that has as its core the traditional liberal arts.

Well, what does this mean with respect to graduate education? I think graduate education is only a small part of the picture. But this kind of reasoning does lead me to recommend, and to recommend to the Foundation to support wherever we can, the opening up of new avenues of education at the graduate level, just as I would like to open up new avenues of education at the undergraduate level and at the high school level.

The Foundation is very limited, of course, in what it can do. We are limited in terms of our charge; we support education in science and mathematics and technology. We are also limited in terms of the amount of funds we have available for this sort of thing. But I do believe we can make a good case for multiple avenues of education at all levels, including the graduate level.

I suggest in this regard that people like yourselves generally place more weight on the Ph.D. dissertation at the graduate level than it can support empirically; that there are other ways to produce a critical evaluative attitude toward research than doing a traditional Ph.D. dissertation. And we do not have to give up these attitudes if we move to other avenues of graduate education. The other avenues that we hope to be able to support with categorical traineeships include most of those that have been discussed here in the last couple of days; new programs for teachers of science and mathematics; programs for science practitioners. Willard Libby, I believe, is talking about such people as science doctors. Not that these persons will do the research required to solve environmental problems, but they will be practitioners of science, advisers to governmental units, perhaps, and industrial concerns.

I suggest that we need more engineers who think like engineers rather than like physicists or chemists. I further believe that we need more biologists who think like engineers and act like engineers. We do have a model in the agricultural school; we also have a model in the public health business; but we need more biologists who think and act like engineers for other kinds of biological problems in our society.

We need more behavioral scientists who think and act like engineers rather than like pure scientists; again, to help to solve some of the pressing social problems in our society.

I am not suggesting, incidentally, that research funds and training support is going to be reduced to zero in the pure sciences—far from it. This is the least of my worries. What I am worried about is that we won't make enough of an effort in the applied direction. We don't have guidelines written as yet for a categorical traineeship program; we don't know that we are going to have one. If we do have one, the following general criteria will be used by the Foundation:

We will look at the program and not at the degree. The degree that you give or award is your business. But we will look at the program, and the program we will expect to be something other than training in the traditional disciplines, the traditional scientific disciplines.

We will also look at the setting of the program and the university support for the program. A program offered by a committee whose salaries and time of the members are taken up by their parent departments will not look as good to us as a program that has better, more effective support.

I don't think we will use the ACE report in our evaluations. Not because we don't think it is a good report for what it attempts to do, but we will apply our usual criteria; we will look at the people involved, the university setting, and the quality of the program.

QUESTIONS AND ANSWERS

W. D. Cooke, Cornell University: Dr. Humphreys, you made a statement that worries me very much. The statement is that we are overproducing B. A.'s. That statement concerns me because it implies that the only reason for having B.A. programs is an occupational reason.

I should hope that we are really about the business of education and we are putting people through liberal arts programs primarily to educate them rather than to train them for specific jobs. Certainly in subjects like literature we have never been training those people for specific jobs.

I have no objections if our B.A.'s become your auto mechanics; I think that would be marvelous. But to speak of an overproduction of baccalaureates almost looks as though you are taking a very strange attitude about what a liberal arts education is, and I wonder if you would comment on that?

L. Humphreys: I don't think it's a strange attitude. I think it's a realistic attitude. Young people have to be prepared for jobs. The traditional liberal arts program will also prepare them for life; I readily accept this.

I do suggest, however, that a B.A. who is out looking for a white-collar job and doesn't find one is in a situation that is precarious for him and, if there are large numbers of him, precarious for society.

I suggest that we try to combine occupational training and liberal arts training and not necessarily relegate occupational training to on-the-job learning. Perhaps we can string out some of the liberal arts training for a lifetime, such as is suggested by the Carnegie Commission. Getting a person in a job and keeping him in an educational setting might be the goal rather than simply educating him and then turning him loose on society without any occupational skills.

W. D. Cooke: I guess we just fundamentally disagree with what I think is the role of a liberal arts education. I think it would be great if we educated essentially everybody to a B.A. level and then have them take whatever jobs they can find or want. I see nothing wrong with it. I guess maybe you do.

L. Humphreys: The main thing wrong with it is that it won't work.

G. K. Fraenkel, Columbia University: If what Dr. Humphreys is saying is the new policy of NSF, then I think the comparison to the Soviet Union is a very good one. The Soviet Union perhaps—I don't know the data—is training people at the lower level to be technicians, and it still is a dictatorship. That's what worries me about everything Mr. Humphreys has said.

L. Humphreys: I think there are different ways of achieving goals. There will be no coercion, of course, on universities; there will be no coercion on students. I do suggest that it is very shortsighted for any society not to plan ahead, not to look ahead and determine needs. I think it if very undesirable to set up a single standard of achievement, a single standard of excellence.

Fifty percent of our population, by definition, is below the median in any one trait or any one hierarchy of ability. If we broaden our sights and look for other kinds of excellence we find empirically that something like 80 percent or more of our population falls above the median in some area.

I would like to see higher education, including graduate education, make provision for such people.

When we talk about sending 100 percent of our population, or nearly so, through traditional liberal arts educational programs, I think that we are simply closing our eyes to the reality of individual differences in abilities and interest patterns, that we ought to capitalize upon rather than try to force everybody in a single mold.

We can be just as dictatorial by setting up a single standard of excellence, perhaps more so than by establishing multiple avenues for achievement.

I. C. Loram, University of Wisconsin: I don't know really that the NSF, which has been a boon to graduate education, has any business telling the liberal arts people on the undergraduate level what to do.

L. Humphreys: I regret that my remarks were interpreted as telling you what to do. I was announcing that with limited funds we are going to support experimental new programs that seem to fit the needs of society.

Now, no one is going to be forced to apply for traineeships; no one is going to be forced to apply for curriculum support if they want to develop a new graduate program. But in terms of the way in which we see the priorities, this is a better way to spend limited funds than by support of the traditional disciplines.

J. L. McCarthy, University of Washington: I guess I disagree in principle with my decanal colleagues because I think what Lloyd Humphreys has said is a good response, and a tough one, to the message that we all ought to be getting.

There isn't any question in my mind that over the last three to five years we have had a shift in the attitudes toward higher education, which all of you are feeling, I am sure—moneywise, too.

And what we are being told by our constituents—I am talking about the donors and the taxpayers and the students themselves—is that there ought to be at least a separate track which would provide the opportunity for students to develop themselves in a much more direct way in service to society.

It seems to me the time is ripe for practitioner's programs in the graduate school. This is a pronouncement of my prejudice. But I do have a question, sir.

It seems to me that the shift in policy away from a balance more or less, I suppose, between NSF fellowships and generalized traineeships into what you are speaking about now raised the question of how much effort and money does the Foundation intend to put into this new, shall I say socially oriented or practitioner-oriented type activity *vis-à-vis* the fellowship programs? Just what is the balance in money?

L. Humphreys: I don't know, I can't answer that. We would like to keep the two in balance; but we propose and others dispose.

Alvin H. Proctor

REPORT OF THE WINGSPREAD CONFERENCE ON THE DOCTOR OF ARTS DEGREE

You will perhaps recall that a year ago the Council of Graduate Schools at its annual business session approved in principle the establishment of graduate programs leading to the Doctor of Arts; as our booklet said "to prepare graduate students for a lifetime of effective teaching at the college level."

This project and this endorsement, I am sure, was not undertaken lightly. There had been many significant developments pointing toward the emergence of a new type of degree for the preparation of college teachers. It was, you will recall, at last year's meeting a highly controversial topic, and perhaps it will be at this session.

I should only like to say in that respect what I think Dean Boddy said last night about another highly controversial topic, the new ACE report. I talked to Dean Boddy after that session and asked him if what he was saying was that a graduate organization like this one and of this importance does not approve and condemn out of hand and emotionally and abruptly something like the ACE report but rather considers it calmly and on the basis of the scholarship which we deans are supposed to represent, then gives a considered opinion.

I would say that our approach to the Doctor of Arts degree should be the same.

I would also like to add that, therefore, neither I nor Dean Wolverton this morning appear as either protagonists or antagonists toward the Doctor of Arts degree, but simply wish to report to the membership what is happening at this stage of the game.

Last August through the efforts of President Page and others we were able to obtain a small grant from the Carnegie Corporation in order to hold a conference on the Doctor of Arts degree. As a result of receiving that grant, a planning committee was established for the conference, and I should like to tell you, because those men worked hard at it, who the members of that planning committee were.

They consisted of Arthur Eastman of Carnegie-Mellon University, who will be the editor of the proceedings; John Gillis, representing the Association of American Colleges; Charles T. Lester from Emory University, whom you all know; myself, who served as Chairman of the planning committee; a distinguished colleague, Stephen Spurr, who served as Chairman of the Conference when it was held in Wingspread; Dean Allen Strehler of Carnegie-Mellon; Dr. Roger Yarrington, representing the American Association of Junior Colleges; of course, our president, Dr. Page; and finally, Dr. Frank Farner, representing the American Association of State Colleges and Universities.

As a result of their work, a conference program was put together and was held at Wingspread on October 25-27. Because of limited facilities and limited funding, it was not possible to invite everyone who is a member of the Council of Graduate Schools, although we were besieged with requests for invitations. Instead, we had to be somewhat selective, not on an elitist basis, I assure you, but on a practical basis. We decided that the conference should be attended by a large number of graduate deans, and this did happen.

Those graduate deans represented not only the Council of Graduate Schools but the Association of Graduate Schools and the like.

We made certain that representatives from certain organizations attended the conference. For example, the National Science Foundation, the American Association of Junior Colleges, the American Association of State Colleges and Universities, representatives from the U.S. Office of Education, and from the American Association of Colleges.

We heard a number of distinguished speakers, and the first day's program in particular was a heated one.

Then on Monday evening Dean McCarthy, in his usual skillful fashion, made an excellent statement, and I think really got us back on the road to constructive considerations. The conference finished its work by the following Tuesday noon.

Now, the Executive Committee asked that we report on that conference. I should tell you that it's proceedings will be published; every member of the Council of Graduate Schools will receive a copy of those proceedings. In addition, I believe that the Executive Committee of CGS has authorized a revision of our own booklet on the Doctor of Arts. The developments have been so rapid and so significant that, in our judgement, this should be done.

And, of course, most of you are aware of the fact that the Carnegie Corporation has granted planning money to ten institutions to consider the establishment of the Doctor of Arts programs. These institutions are M.I.T., Brown, Dartmouth, SUNY at Albany, Ball State, Idaho State, the University of Michigan, Washington State University at Pullman, the University of Washington, and Claremont.

At any rate, in considering the program, I thought about Bob Wolverton, Dean of the Graduate School at Miami University at

Oxford, Ohio. He is a very sane, sensible, and clear-thinking person, and he attended the conference. Therefore, I shifted the burden to Bob and asked him to summarize in a ten- to fifteen-minute statement what he thought he heard at Wingspread last October. That now is his assignement.

Robert E. Wolverton

Perhaps I also qualify as that well-known, mild-mannered humanist. Some of this will be a bit repetitious because I didn't know exactly what was going to be said by way of introduction.

Supported by the Carnegie Corporation and by the Johnson Foundation, the goal of the conference was stated in the following terms:

> Our purpose is to provide an opportunity to explore together this significant development in graduate education. We anticipate publication of proceedings which we hope will stand as definitive guidelines and standards against which developing programs may be measured. Overall, our purpose is to provide encouragement and guidance to the end that the new degree will have stature, that high and appropriate status will be established, and that those earning the degree will have the kinds of educational experiences and training so clearly needed in preparation for effective teaching.

Given the purposes just stated, the conference was, to this observer at least, a great success. Sherry before elegant lunches and cocktails before even more elegant dinners, accompanied by friendly fires in the fireplaces, made the whole conference even more successful and allowed time for less formal exchanges of views, ideas, and prejudices.

This brief report cannot possibly touch upon all the points made throughout the days of deliberation, but I do wish to pass along some facts and some personal observations. I shall try to distinguish the facts from the observations so you may give the proper credence to the one and the proper skepticism to the other.

First, the facts. Fact one: The Doctor of Arts Degree is now a reality. The question Will there be such a degree? is no longer valid since such diverse institutions as Claremont Graduate School, the University of Washington, Drake University, and Ohio State University have begun or are planning programs and since, as you just heard, the Carnegie Corporation has made a sizable investment to ten institutions in implementing programs.

Fact two: Doctor of Arts programs are quite diverse in their nature, but all include elements designed to assist potential college instructors. Thus, some programs, such as those at Carnegie-Mellon, are primarily concerned with curricular reforms and innovations while others are broadening departmental areas at the doctoral level, such as Germanics at the University of Washington or Slavic languages at Ohio State.

Regardless of the subject matter area, however, nearly all programs include a year-long teaching experience, not practice teaching nor a teaching assistantship but rather a year of service as a full faculty member under the supervision of a master teacher, a mentor, or even in some cases, a committee.

Many programs also include such courses as the history and philosophy of higher education, cognitive processes, research seminars, and the teaching of that particular field.

Fact three: There is a market for those who have received and will receive a Doctor of Arts degree as evidenced by the placement of those who have already received the degree from Carnegie-Mellon University.

The community colleges, which are growing, we are told, at the rate of about one a week, and four-year undergraduate institutions seem particularly eager to hire doctors in the original sense of teachers, persons who can teach more than just a fragment of a given field and who can educate students of varying backgrounds and varying abilities.

Fact four, and a fact that caused some concern: The Doctor of Arts degree is being utilized variously by different institutions. When one institutional representative reported that his institution was awarding the Doctor of Arts degree as a recognition of candidacy to the Ph.D., some eyebrows were noticeably raised. Others were raised when another institutional representative noted that his university was giving the D.A. instead of the Ed.D., but at the end of the same program.

Fact five, and a very happy fact: Fellowship support for Doctor of Arts programs may be forthcoming under Title IV of NDEA, *provided* research competence, teaching experience, and quality and rigor comparable to Ph.D. programs are build into the D.A. programs. Thus, the D.A. may well be declared the equivalent to the Ph.D. and may be supported, assuming that NDEA itself survives and is funded.

Fact six: There are still problems associated with the emerging Doctor of Arts degree. At least two of these are national in scope and are not peculiar to the Doctor of Arts. One is the drying up of federal funds in support of research and students; the other is the growing surplus of Ph.D.'s in some fields.

But more directly involved with the Doctor of Arts is the problem of quality—how to build it in at the beginning and how to maintain it.

If the degree is to be comparable to the Ph.D., it must have quality controls in admission, in faculty, programs, standards of performance, and degree requirements. Yet can quality be guaranteed if breadth rather than depth is a desideratum, and if teaching the field is considered equally as important as knowing the field? Or, again, can proper quality be guaranteed if institutions which could never aspire to the Ph.D. fancy themselves capable of operating quality Doctor of Arts programs? Should some restraints, or at least guidelines, be established to limit effectively the departments or institutions hoping to inaugurate Doctor of Arts programs?

Another problem, which time and numbers may resolve, is that of the reward system of higher education. Will it be honestly willing to retain and promote those who excel in teaching as well as those who excel in research and publication?

Still another question is, Who will teach these prospective teachers? Can the typical Ph.D. holder overcome his honestly, but often wrongly, held belief that the only way to learn how to teach is to sit in one of his classes? Can he, as a typical Ph.D., really supervise the student who is not necessarily interested in learning more and more about less and less? Or, in the larger frame; will departments now awarding the Ph.D. be interested in cutting back Ph.D. admittants and replacing them with Doctor of Arts admittants? Can a department be persuaded to do this?

Parenthetically, the obverse question might be asked: Will students who have a real choice automatically opt for the Ph.D.?

These were not the only problems raised, but they serve to illustrate some of the legitimate concerns voiced by many of the Wingspread participants.

Let me now turn to a few personal observations, again based upon formal and informal conversations. First among these is what I shall call the "expectation gap" which exists between undergraduates and community colleges on the one hand and the major Ph.D.-granting institutions on the other. While the former expect to hire instructors able to teach a variety of courses in a given field to students of all levels and abilities, the latter expect, and sometimes tacitly assume, that all their Ph.D.'s will serve sufficiently well as teachers while they become research scholars.

Caught in the middle of this "expectation gap" is the student who has his own career goals and expectations and yet may be pulled between the Doctor of Arts, which may offer exactly what he wants, and the Ph.D. which, according to his Ph.D.-holding adviser, may offer greater security and rewards, not to mention its value as a union card.

A second observation is associated with one of the problems mentioned in Fact six above. I am not convinced that all emerging Doctor of Arts programs are of the quality they should be. Some institutions do seem to be offering the Doctor of Arts as the easiest and surest way to get into doctoral level work without having spent enough time and enough effort investigating their own resources and objectives.

Perhaps regional accrediting agencies can assist the Council of

Graduate Schools in such investigations and evaluation, thereby assisting the institutions themselves in setting valid goals and objectives.

A third observation is that there can *in fact* be quality Doctor of Arts programs as rigorous and as qualitative as most Ph.D. programs. Just as, historically, the Doctor of Education is and should be functionally different from the Ph.D., so the Doctor of Arts should be functionally different from both the Ph.D. and the Ed.D. All three can have their own integrity; all three can be sold to the public and to legislators; and all three can have recipients rewarded for excellence. The Doctor of Arts, furthermore, can provide a vehicle for experimentation that neither the Ph.D. nor the Ed.D. can on most campuses.

A fourth and last observation is that much of the success of the Doctor of Arts degree depends upon the attitudes of the major Ph.D.-granting institutions and the Council of Graduate Schools. Positive, helpful attitudes reflected by institutions' willingness to establish Doctor of Arts programs side by side with Ph.D. programs, or perhaps even in place of some Ph.D. programs, coupled with this Council's guidance and honest concern for quality can insure success for good, needed Doctor of Arts programs.

This Council, really all of us here assembled, must make a commitment of some magnitude and magnanimity if the Doctor of Arts is to mature and become a viable alternative to the Ph.D.

To quote again from the Purpose of the Conference:

> To provide encouragement and guidance to the end that the new degree will have stature, that high and appropriate standards will be established, and that those earning the degree will have the kinds of educational experiences and training so clearly needed in preparation for effective teaching.

Or, to put it another way, we must not allow ourselves to echo one of Charlie Brown's famous plaints, "I suddenly feel a great wave of wishy-washiness sweeping over me."

QUESTIONS AND ANSWERS

A. N. Collins, SUNY at Albany: I was at Wingspread and I was a little disturbed the other day when Professor Adams reported on the meeting of the ADE which took place at Amherst, I think, on the day before we began at Racine. We had a report on the ADE Conference given by Mike Shugrue, who is English Secretary of the MLA.

I wonder if Mr. Wolverton's notes would tell us what the point of Mr. Shugrue's report was, because I think it differed in substance from what Mr. Adams said was the attitude of the department chairmen in the Departments of English.

R. E. Wolverton: There are two ways of answering that. One was that Mike Shugrue did point out that there was apparently existing in the field of English a great deal of what I referred to as the expectation gap; institutions looking for people particularly capable of teaching various parts of the field of English to which there has been little or no response on the part of the major Ph.D.-granting institutions.

He also pointed out that there was need for much more experimentation at the doctoral level. He did say that no new Ph.D. programs like the present ones should be established, and he argued that either changes ought to be made in the Ph.D. itself and/or the Doctor of Arts should be established and prove its own worth as meeting what he called the needs of the teaching of English. That would be my answer.

W. R. Ferrante, University of Rhode Island: I would like an explanation of the official position of CGS relative to the Doctor of Arts degree. In January, 1970, the Newsletter carried the following item:

> The Minutes of the Business Meeting of CGS, including the full text of the provisional statement of the Doctor of Arts degree have been circulated to the membership. The Committee on the Preparation of College Teachers is now preparing a further revised draft of the statement for submission to mail vote of the membership.

I don't recall that my university was asked to vote on a revised draft Recently—I believe it was in March—CGS issued a new pamphlet, and the opening words are:

> The Executive Committee of the Council of Graduate Schools and the Council have in principle recommended the establishment of graduate programs leading to the degree of Doctor of Arts.

And just a few months ago, Dean Proctor mentioned a revision of this draft. Has the Council membership been asked to vote or vote in principle to endorse the D.A., as the Newsletter suggested we would be asked to do? And will the new draft include any statement giving the Executive Committee's recommendation or the CGS membership recommendation?

A. H. Proctor: Thank you. Those are fair questions, and I shall try to give you a factual statement about them.

At the business session—and I do not have the minutes of that session a year ago in front of me—I believe the resolution simply did state that the Council endorses in principle. It did not endorse in any detail.

It is true that the statement was made that we hoped to circulate by mail a revision and give the members of the Council an opportunity to comment about it.

However, you will recall that events were moving very rapidly at that time. The American Association of State Colleges and Universities had already prepared and, in fact, issued before we could a statement about the Doctor of Arts degree. We knew that other developments were occurring, such as consideration by the Carnegie Corporation. We knew in fact—and it is a fact— that institutions were, entirely apart from our organization or any other, actually establishing and announcing the degree, and had such programs under way. And therefore, some haste in having tentative guidelines with the CGS imprimatur on them were rather important. Therefore, the Committee on the Preparation of College Teachers prepared this booklet, which is a very tentative statement, and it was printed—and I want to emphasize—with the consent of the Executive Committee. The Executive Committee must authorize any publications that carry the CGS seal.

Now as to what will be done concerning a mailing referendum, I cannot project. I will not be a member of the Executive Committee after this session, and it will be for the Executive Committee to decide.

I can only assure you and say with some confidence that anything that is done will be cleared by the Executive Committee. Neither the Committee on the Preparation of College Teachers, nor any other committee, can take any action in the name of the Council without the consent of the Executive Committee.

S. C. Brown, Massachusetts Institute of Technology: I would like to point out that the Carnegie grant to M.I.T. was not to implement the D.A. but, rather, to study alternate routes to the Ph.D. And although there is a possibility, we are very far from implementing such a degree, and we really are taking the terms of our grant very seriously, to study alternate routes to the Ph.D., not necessarily the D.A.

A. H. Proctor: Thank you. One of the rather interesting developments in the United States, perhaps precipitated by attention to the Doctor of Arts, is that there is considerable revision of the Ph.D. under way across the land now. I believe the University of California at Berkeley has announced a new track program for the Ph.D. for undergraduate teachers in physics and mathematics. Of course, Charles Lester, at Emory, has had a double track program for the Ph.D., I think in history and English, and there are others in the country.

So perhaps one of the by-products has been that type of format.

Business Meeting

Friday, December 4, 10:00 a.m.

Presiding: Mina Rees, *Chairman, Council of Graduate Schools*

Rees: We proceed now to the CGS Business Meeting. The first item on the agenda is the Report of the President.

I would like to take this opportunity to express on behalf of all of us our appreciation of the smooth way in which our new president, Boyd Page, has taken over the affairs of the Council. This is a non-trivial operation. And I think all of us who have been closely associated with him have greatly admired the way he has taken on this job.

So I want on behalf of all of us to welcome Boyd in the new job and express our thanks for his able assumption of the responsibility. *(Applause)*

PRESIDENT'S REPORT

Page: Thank you so much. Madam Chairman, Ladies, and Gentlemen: I want you to know that I consider it a high honor and a personal privilege to serve the Council as president. I pledge to you my best efforts to further our common cause.

I join enthusiastically in our expressions of affection and high regard for Gus and his distinguished leadership; and I hope most fervently that nothing I might do or fail to do will in any way diminish the stature which the Council has achieved while Dr. Arlt served as its first, and only, president.

The Council is an organization of which we can all be proud; it is strong, and it is in good order. It has become in its relatively short lifetime an effective spokesman for graduate education and a potent force in setting standards and patterns and in maintaining quality.

One does not have to be much of a prophet to see that we will soon be called upon to exert our best efforts in defense and promotion of quality in graduate work in what are already turbulent times.

We have in the Council a finely honed instrument, and it will be our job collectively to discover how to use it most effectively.

This is billed as the "President's Report." To a large extent, much of what is pertinent has already been reported most eloquently and appropriately at the Tenth Anniversary Luncheon by President-Emeritus Arlt, who continued to serve, I remind you, as president for the larger fraction of the year that has passed since we last met in Washington.

The many and varied activities of the Council have continued, and I hope that the transition has been accomplished smoothly. I appreciate your kind words, Madam Chairman.

The Council continues to grow, with several applications for membership now under consideration. We are, or soon will be, three-hundred strong. On the basis of the latest reliable statistics, Council members awarded 96+ percent of the Ph.D.'s awarded in the United States and 84 percent of the master's degrees. So even though we may not be able to say that the Council speaks for all graduate education on every issue, because unanimity is very hard to come by, still the Council clearly represents the major components of the total graduate enterprise.

Because needed current statistics on graduate enrollments were not available, we did initiate a rather simple little study. Only preliminary summations have been made, but I thought you might be interested in the results. When we left the office, 150 reports had been returned. This is already a 50 percent return. On the basis of published institutional listings of graduate offerings, I estimate that the returns now in represent at least 76 percent of the total graduate enrollment in the United States.

On the basis of our survey, graduate enrollment in October, 1969, was 254,256; in 1970, 267,760. That is an increase of 5.4 percent. Total new students were also up 5.5 percent. A comparison of the number of teaching assistants on appointment shows an increase of 2.2 percent; research assistants, down 3.5 percent; and fellows, down 5.4 percent.

As you can see, these figures run contrary to what is frequently assumed. It is "common knowledge" that graduate enrollments are sharply down, that there are very few assistantships available, and so on. You know the story. The changes in the current year seem, on the basis of this preliminary information, not to be as dramatic and as far-reaching as some people have assumed.

Examination of the returns reveals that some of the larger institutions do show some reductions since last year. The overall increase, then, seems to come about by virtue of the fact that there are many smaller institutions that are growing rather rapidly.

Our consultation service continues to grow. This is under the very excellent management of Jim Eshelman, and I would like to give him a special award if we had one for conducting all of the affairs of the

Conference. I think he has done a superb job, and we thank you for it, Jim. *(Applause)*

Let me also thank Miss Saul and Mrs. Corbin for the superb job they do. These people do most of the work of the Council, and I am happy to recognize their fine service. *(Applause)*

The consultation service continues to grow. In 1969 there were 45 schools visited, 82 programs reviewed, and 127 consultants sent out. In the first ten months of 1970, the service has already sent out 141 consultants to review 92 programs in 49 schools. Requests for additional consultations continue to come in. We are now receiving requests for consultations on D.A. programs, and see signs of increasing activities by coordinating boards and by new consortia. So we can expect this to increase. But even at our present level, the cash flow for the consultants and their expenses alone in the ten months of this year has amounted to approximately $50,000.

Many of you heard the report on the Wingspread Conference on the Doctor of Arts degree. I believe those who were privileged to participate judged the conference a success. It was a very interesting and stimulating workshop. We feel that the report, which will be available in a few months, will be a significant contribution toward assuring quality in the newly developing programs.

Many of you heard the report of the Gradcost Study. This was initiated early in the summer, supported by National Science Foundation. The study is fully underway and apparently going very well. It is under the guidance of an Advisory Committee chaired by Dean Deener, and the Project Leader is our good friend, Joe McCarthy. Seemingly everyone is anxiously waiting for the results, and I am happy to report that what has been accomplished already holds promise of highly significant results.

A number of you attended the third Summer Workshop, on the shores of Gull Lake at Brainerd, Minnesota. It was very effectively managed by Bryce Crawford and his colleagues at the University of Minnesota. This was by any measure a very successful workshop, and we have received many favorable reactions from the participants.

Many people have asked about the continuation of the workshops. I am happy to report that the Executive Committee has decided that the workshop program should be continued. Because outside funding is now limited, there will of necessity be some changes. The next workshop will be held on the campus of Dartmouth College, in Hanover, New Hampshire, probably the week of August 8th. Facilities appear to be excellent. Dean Hornig will be chairman; there will be a committee appointed; you will hear more about this. It may well be that we will have to limit the number of those who can attend. So I suggest that new deans, associates or assistants, or deans who wish to be retreaded, should move early to apply.

We hope you will consider the Annual Meeting a success. You are aware that there were some innovative changes made in the attempt to get more participation, to provide the opportunity for all to participate a little more actively. We have had some very active participation, and hope you have liked the arrangements. We solicit your comments and any suggestions that would be directed toward improving our future conference. The impression I have from several comments is that you rather enjoyed having your dinner hour free. Several have suggested that we consider elimination of evening meetings. Other ideas are under consideration. The chairman of the program committee for 1971 is Chairman-Elect Deener. Please let him or any of us know what your wishes are.

These are housekeeping details that I felt constrained to report. At the risk of belaboring the obvious, I would like now to make just a few very brief comments. There clearly will be changes in graduate education, and there will be increasing stresses and strains tugging at the fabric of graduate education. Some of them we see already. Groups which have ignored or which have tolerated graduate education are now out to restructure, or even in some cases it appears, to emasculate or to dismantle what has been so painstakingly designed. The whole cloth has not been without its flaws, and it certainly is not uniform; but we must not allow it to be destroyed. There will be changes, there may be much fraying, and there may be some tears, but a fabric—notice that I did not say "the" fabric—must be held together. I hope that this can be done without resorting to expediencies and without patchwork.

Our enterprise surely will be attacked—or neglected—in the short run, but society will continue to need highly qualified scholars and experts; and we must work to maintain a high capability.

The graduate dean is the guardian of quality; and if he is worthy of the trust, no one, and hence no group, is as well qualified to initiate reform or to redesign or to reweave where necessary as is the individual graduate dean and his collective instrument, the Council.

There are those who say that graduate education as we know it today may not exist a few short years from now. This causes concern, but not apprehension. Possibly graduate education should not exist as we know it now. But that it should not exist in some form is unthinkable. Our job will be to lead and not follow in the coming changes, to act and not just to react.

I don't wish to appear to be waving the flag or sounding a charge. All I mean to say is that we should think through very thoroughly what we are about. We may be called upon to defend elements of graduate education that should need no defense; and, as needs of society change, parts of our operation may be challenged which in good conscience we may not be able to defend. If we do our jobs well, we will know the difference and know when to stand firm or lead out in effecting needed changes.

If the graduate enterprise is to be redesigned, then we, the experts, should have a hand in the designing. But we will be granted this role only if we submit the best design, and it is clear that the self-appointed architects of the new grand plan are already very busily at work.

I don't know all of the ways in which the Council can be more effective or how its influence can be best exerted. I have some ideas, as I am sure you have, but I am convinced that the need for the instrumentality that is the Council of Graduate Schools is more pressing now than it has ever been. If we are to be effective—and we must be effective—joint action through the Council offers the best hope.

As president of the Council, I solicit your best efforts and continued participation in the affairs of the Council and solicit your suggestions and your help. I think that we will have an interesting and maybe an exciting year ahead of us. Thank you.

(Applause)

Rees: The Executive Committee is charged, first, with the selection of the Chairman-Elect, and it is my great pleasure to report that the committee has chosen Dean David Deener, of Tulane, to be Chairman-Elect for the next year. Dean Deener, would you join us?

(Applause)

The second charge to the Executive Committee is to propose nominations for new members of the committee. Because Dean Deener has a year to run, we are proposing for a one-year term, Dean Carroll Miller of Howard; and for the two three-year terms, Dean Elizabeth Foster, of Bryn Mawr; and Dean Robert Wolverton, of Miami University of Ohio.

The nominations are before you. Are there any further nominations? If not, may I hear a motion to close the nominations? I think it has been moved and seconded. Those in favor please say Aye. Opposed, No.

We will ask Mr. Eshelman to cast the unanimous vote of this body.

The third action of the Executive Committee that I should report is a decision that is closely related to things that have been happening. As President Page just said, we spent a considerable time at this meeting girding ourselves to act rather than to react, and part of the charge in this connection will be initiated by the Committee on Policies, Plans, and Resolutions. Mike Pelczar will be reporting on that.

However, one of the situations which the Executive Committee was concerned about—and I judge a great many members of this body were concerned about—was discussed last night. I refer to the report that is to be published shortly by the American Council on Education on the rating of graduate programs. The Executive Committee has decided to ask an *ad hoc* committee, immediately upon publication of this report, to undertake a study and present promptly to the Council a considered review of the report. I conclude from the discussion last night that this decision is one that will be welcomed by at least very many members of the Council. I hope that we can get a very careful study of this, with recommendations.

The important position that the Executive Committee took here, as elsewhere, is that in matters dealing primarily with graduate education, or heavily with graduate education, this Council must be heard and must influence what happens and not merely react to what happens.

There are five committee chairmen who have asked to make very brief reports running to about five minutes each. I wish to point out that the written reports that have been submitted by committees will be included in the *Proceedings* of this meeting. Moreover, part of the planning for this meeting was to have the workshops devoted to materials produced by the committees, and I know that probably all of you attended one workshop.

The reports I have had seem to indicate that the workshops were very helpful. So the committee reports we will hear now represent only a segment of the activity that our twenty-two committees have been carrying on.

I will call now on the chairmen of the five committees who have asked to report. The first of these is Mike Pelczar, Chairman of the Committee on Policies, Plans, and Resolutions.

REPORT OF THE COMMITTEE ON POLICIES, PLANS, AND RESOLUTIONS

Pelczar: Some of what I have to say will be repetitious. But I hope it will be more effective that way since the Committee on Policy, Plans, and Resolutions will be calling upon the membership for their cooperation in contributing suggestions to facilitate what has already been referred to by Boyd Page and by Mina Rees; namely, that the Council of Graduate Schools emerge to a position of action rather than reaction or, as Gus Arlt said yesterday during his luncheon speech, we should emerge more into a position of leadership rather than be followers.

Since the membership of CGS does have a relatively significant turnover, I thought it might be appropriate to mention something about the Committee on Policies, Plans, and Resolutions since it is a relatively new committee. When this committee was established, in 1968, Dean Herbert Rhodes was named Chairman.

You may recall that Dean Rhodes sent a questionnaire to all member deans of the Council asking them, in his words, what was bugging them. He received a tremendous array of items which bore out a statement that Meredith Wilson recently made at the Association of Graduate Schools, namely, that there is no group that has more unfinished business than graduate deans.

This long list of topics was carefully reviewed and collated by Dean Rhodes. The Committee then studied the list and proceeded to assign each question or problem to an existing committee, or, where there was no committee appropriate to give attention to the matter, the Committee suggested that the Executive Committee establish a new committee. This was done. There are some twenty-two committees now in being. We feel that there is a more effective committee organization now available, and I think that you saw some evidence of the work of the committees in terms of the workshops that were held yesterday afternoon. Each meeting was arranged by one of the committees.

Of major concern to the CPPR at the present time is what has already been alluded to by both Boyd Page and Mina Rees, namely: How can the CGS emerge more significantly and effectively as the spokesman or coordinator or leader, if you please, in matters relating to graduate education? What are the priority items that we should have on the agenda, and how might we best deal with them?

The Executive Committee has requested that the CPPR give immediate attention to this matter and develop recommendations for submission to the Executive Committee prior to their meeting in April.

We accept this charge and responsibility, and we will be soliciting the membership of the Council for their suggestions and guidance as to how we might best do this. So in the near future you will be hearing from us. We trust that you will convey to us your best judgment as to how we can formulate the plans that we need to transmit to the Executive Committee.

Rees: The second committee that has asked to make a brief report is the Committee on Non-Degree and Other Post-Baccalaureate Programs, of which Dean Albrecht of the University of Kansas is Chairman.

REPORT OF THE COMMITTEE ON NON-DEGREE AND OTHER POST-BACCALAUREATE PROGRAMS

Albrecht: Madam Chairman: The Committee on Non-Degree and Other Post-Baccalaureate Programs is supposed to deal with post-baccalaureate work outside of conventional, resident, full-time, predoctoral programs.

The committee met in Washington in May and again on Wednesday in the Hotel Fontainebleau. Yesterday we conducted a workshop attended by about fifty people, a large number of whom it seemed to me participated in the discussion.

We have also prepared a seven-page report covering (1) special problems of professional education in non-degree courses; (2) guidelines for extramural centers for resident graduate work, often on a part-time basis; and (3) post-doctoral appointments.

We discussed these three points yesterday, in addition to programs for retreading Ph.D.'s whom technology and a changing society have left behind.

The discussion from the floor indicated a good deal of interest in extramural centers and particularly—to a greater extent than the committee had anticipated, I think—in non-degree programs, not only for professional purposes but also as continuing education both for leisure and for greater social responsibility. Several people expressed the feeling that graduate schools should expand their operations to include high-quality continuing education of this sort in both degree and non-degree programs.

There was also a motion, an unsolicited motion, from the floor that our report should be made available to the total membership of CGS, but I assume that this will be taken care of.

Rees: Thank you, Dean Albrecht.

As I said, all these reports will be published in the *Proceedings*, so it will automatically be made available to the entire membership.

Now we shall hear from Wayne Hall, the Chairman of the Graduate Record Examinations Board, in which the Council of Graduate Schools participates.

REPORT ON THE GRADUATE RECORD EXAMINATIONS BOARD

Hall: Madam Chairman: It is my pleasure, on behalf of the Graduate Record Examinations Board, to give you a brief report of the major activities occurring during the past year.

The past year has been a very active and important one in the history of the GREB. A number of major decisions have been reached and important projects undertaken which may have implications well into the future.

To refresh your memories, the Graduate Record Examinations Board was established in 1966 as a trustee for the graduate community to provide policy direction and supervision of the Graduate Record

Examinations and in other ways, to be beneficial to the general interests of the graduate schools.

Subsequently, as you know, the Graduate School Foreign Language Testing Program was brought under the purview of the Board.

During the past year the Board has met twice, the Executive Committee has met four times, and other standing committees of the Board have met on several occasions. For the sake of brevity, I will only outline the major activities and programs that have occurred during the past year. They can be summarized largely under five major headings, although there are other activities, which will be omitted.

First, a plan that has been under development and discussion for the last two years was approved by the Board at the March, 1970, meeting, to completely restructure the Graduate Record Examinations. Re-design of the examinations is to take place over the next two to five years and this exercise involves both the Aptitude and the Advanced Tests.

The Aptitude Test will be retained much in its present format, but considerably shortened so that the additional time gained can be devoted to the measurement of other indicators that will be useful.

The Advanced Tests probably in most cases will be re-designed much along a modular basis, although the Committees of Examiners actually have three options available to them concerning recommendations. They can recommend re-design of the Advanced Tests much along the guidelines that have been approved; they can recommend continuation of the Advanced Tests in their disciplines, much as presently constituted; or they can recommend abolishment or discontinuation of the examination.

The Research Committee has been extremely active during the past year. The Board first approved and adopted a plan of research for the 1970's, which has been distributed widely to the membership of CGS. I will not dwell upon this aspect other than to state that some thirty projects either have been completed during the last year, are still in progress, or are being planned. These research projects relate not only to the examinations, but they may also have possible significance to other interests of the graduate schools.

The Board has also undertaken and is actively considering a number of research and action programs aimed at defining and mitigating the problems related to the admission and testing of students from minority, disadvantaged, or poverty backgrounds.

During the past year an extensive effort was made to collect, analyze, and distribute information about the policies and practices related to graduate admissions and fellowship selection. This program has been a three-phased effort. First, a survey questionnaire was prepared and distributed to the CGS membership. The data collected was analyzed and published with the hope that the results can be used by graduate schools to improve their own admission and fellowship selection procedures. Secondly, visitations were made by selected teams to six representative institutions to study in detail their practices. The result of these case studies have also been published and distributed. The third phase has been the sponsorship of regional conferences. Four have been held to date and the final one will be held next week on the West Coast. The response received from the participants indicate that they have been quite well received, and that the results of these conferences have been deemed worthwhile.

Lastly, the Board has been concerned about matters that deal with the Graduate School Foreign Language Testing Program. This program has been under intensive review for several years. There has been a considerable reduction in the volume of candidates taking the tests, probably attributable to several factors. Perhaps the most important is a continuing change from a graduate school-wide requirement to a departmental option. Also, the mode of administration of the examination from an institutional method to a national program has also probably contributed to this decline. The Board, through its GSFLT Committee, is concerned about this particular issue and is continuing to study the matter carefully. A survey now underway should provide results to either improve the Foreign Language Testing Program or to guide the Board's decision to eventually drop the tests, if this is indicated and desired.

Briefly, Madam Chairman, this is my report.

Rees: Thank you, Dr. Hall. The fourth report is on the Committee on Financial Aid for Graduate Students. Dean Shirley Spragg, of Rochester.

REPORT OF THE COMMITTEE ON FINANCIAL AID FOR GRADUATE STUDENTS

Spragg: Madame Chairman, Colleagues: Our Committee on Financial Aid met in Washington in October. It was obvious that we were meeting at a time of great flux and uncertainty in the prospect of support for graduate students, and that much of what we would concern ourselves with would have to be presented in an interim fashion rather than in a definitive report. Nevertheless, we did concern ourselves with a number of problems. We have submitted a fairly extensive report, and I shall try here simply to indicate a few of its highlights.

We have reviewed briefly the statistics of the past decade, which I think are familiar to you and which have been referred to by several speakers in the past two days at these meetings.

We are concerned that if cutbacks in federal support prove to be as severe as seems likely at this time, doctorate production in the next three or four years might be reduced to the rate of about 1962 or 1963; that is, about one-half of the 1969 levels.

This statement needs to be hedged a bit because the reduction will depend upon the type of institution and upon the kind of programs. Support levels vary, obviously, from field to field and by type of institution.

But if this statement has any first order approximation validity, such a cutback would produce a severe discontinuity in doctoral production and later in the coming decade even a frantic acceleration in output might fail to meet society's needs in the latter years of the decade.

We feel that we must be concerned not so much with the possible oversupply of doctorates at the moment but rather with maintaining support levels so that we not only meet present needs but can achieve the output which will be needed by 1980.

Our committee feels strongly that the Council of Graduate Schools and every one of its member institutions must continue vigorously to make the case that graduate education is an important national resource; that the beneficiary is not simply the individual, but also the nation; that our society depends upon a flow of highly trained and educated young people to man its schools, its universities, its laboratories, its businesses, and so forth; and that support should not be turned on and off like water from a spigot.

We viewed with a good deal of concern the proposals that were available to us at that time from the proposed Higher Education Act of 1970, especially those having to do with an apparent shift in emphasis from support programs to programs predominantly concerned with loans, subsidized or otherwise. We feel strongly that if some of these proposals prevail, this will be a serious retrograde step in the support of graduate education. It could place an extremely heavy burden on a young person for many years and would probably be an unacceptable burden to many.

We feel further that an emphasis on loan programs may have an undesirable self-selection feature and produce a result quite contrary to the outcome hoped for by those who have put forward these proposals. We believe that in general young people from lower socio-economic groups will be suspicious of loan programs and will participate in them less than would be hoped, and hence will be under-represented in graduate programs, which would be the opposite of the intent of these proposals.

We feel that there may also be a self-selection with respect to fields. There may be less of a willingness for the graduate student, for example, in French literature to assume a heavy loan burden than for a graduate student in mathematics or computer science or certain other fields.

We grant that we may be facing a period in which, in some instances, loans may perform a useful function as a supplement to direct support, but we urge strongly that loans not replace fellowships, traineeships, and other kinds of direct support, and we believe that in any event a loan burden should not be more than the equivalent of one year of the cost of graduate education.

We felt in our deliberations the need for firmer projection figures, and we urge the Council of Graduate Schools to become even more actively engaged in encouraging and participating in projection studies which can serve as a solid basis for recommendations for support programs.

We looked at levels of support and noted that the yardsticks in these fields, the federal support levels for fellowships and traineeships, were set almost ten years ago and are now very sadly out of date. We studied the 1968 report of the FICE group, the Federal Interagency Committee on Education, and we urge that the stipend level recommended by that group for 1972, namely $3,000, be the yardstick immediately. I was pleased to note that in his presentation to us, Lloyd Humphreys of NSF indicated that NSF's plans for fellowships and traineeships have involved a considerable increase in the stipend level above present amounts.

We believe also that for those students who are on support, it is important to maintain full and adequate support, even if this may mean some lessening in the total numbers supported. It was our feeling that better support of perhaps a smaller number, well and highly selected, might result in a greater contribution to society than spreading inadequate support across a larger number.

We gave some attention to the question of part-time students. Even though this may not be a palatable alternative, we recognize that in the years immediately ahead we may need to pay more attention to the support of part-time students. Many institutions, of course, have limited their direct aid in stipends or in tuition scholarships to full-time students. It may be that in an effort to maintain our supply of doctorates, we may need to study seriously the opening of support programs to part-time students, or at least to the very best of them, who will have their full-time jobs elsewhere. Thus, through tuition support we may be able to provide them with some incentive and possibility of completing advanced graduate education programs.

This sort of support opportunity obviously would be of more concern to those institutions having a high tuition schedule than for those with more modest tuition rates.

Rees: Thank you, Dean Spragg.

On the matter of part-time study, the Executive Committee particularly asked the Committee on Policies and Plans to include concern for that in its planning for the long-range development of graduate education.

Our next report is from the Committee on Disadvantaged Students. Dean Edwin Lively, of the University of Akron.

REPORT OF THE COMMITTEE ON DISADVANTAGED STUDENTS

Lively: Madam Chairman: The Committee on Disadvantaged Students has been in communication through the fall by mail and has had two sessions at this meeting.

The portion of our mandate which is of particular concern at the moment is to survey the graduate schools on policies, plans, programs, and problems in this area. We have, in our discussions, become aware that this is a very complicated task, as the types of programs and the range of interests among these schools seems to be extremely varied.

We are in the process of developing a questionnaire which will be circulated among the graduate schools during the coming year. We do not have a specific time schedule yet. I really asked for time to make this report to request your cooperation when you receive the questionnaire and to fill it out as conscientiously and accurately as you possibly can because the next phase of our mandate is to develop guidelines for graduate schools with regard to disadvantaged students. We will be using questionnaire returns as the basis for these guidelines, and the more adequate the information contained therein, the better the guidelines we will be able to develop.

Rees: Thank you, Dean Lively.

I assume your committee has the report that is based on a prior questionnaire in this subject?

Lively: Yes, we are seeking to develop something with more depth and more comprehensiveness.

Rees: Dr. Deener has asked for an opportunity to make a brief report on the Gradcost Study.

REPORT OF THE COMMITTEE ON THE COSTS OF GRADUATE EDUCATION

Deener: In view of the obvious interest in this subject of the cost of graduate education and what has transpired at this meeting, I thought a few minutes to bring you up to date would be useful.

You will recall that the whole question of the Council of Graduate Schools doing something in this area was raised two years ago by Dean Kilpatrick of Delaware, who, at a business meeting in San Francisco, simply reported the fact that graduate education was being cost accounted by all sorts of people. The feeling was accepted by the business meeting that the Council itself ought to have something to say about the method in which graduate education is being cost accounted.

Trying to get into this in a meaningful way was a little torturous because so many agencies are interested in it. But under the leadership of Dean McCarthy, the format was finally adopted successfully. It was for the Council of Graduate Schools and the National Association of College and University Business Officers to make a joint proposal to the National Science Foundation to support a study of basically the literature and the methods currently used for cost accounting and then to identify alternative procedures for costing graduate education and identifying some of the benefits.

It is a one-year program basically, and I believe the grant came through finally in April of last year. At this meeting the working group under Dean McCarthy made a report at the workshop. They are so much further along in searching the literature and doing their homework that we found it possible to speed up the process. In January of this coming year a meeting will be held in Washington of the Joint Committee of the Council and NACUBO to take up the really meaty questions; that is, the alternative procedures that have been used, the rationale behind them, the philosophy indeed of the whole business of cost accounting, and the benefits of graduate education.

We feel now pretty well satisfied that this report will be finished by the summer, and it will be published in the fall.

I think we all owe a debt of gratitude to Dean McCarthy for putting an immense amount of time on this and for his ability to select a very fine group of people to carry out the study. We have tried to finish it up in a year, and I think it will be done.

Rees: Thank you very much, Dr. Deener. That brings us then to the end of the reports that are scheduled to be given at this meeting and to the topic of New Business. Is there any New Business to come before the body? Dean Stone?

NEW BUSINESS

Stone: New York University: It looks as though the meeting is about to come to a close so I would like an opportunity, since this is my last appearance as a graduate dean, to make a comment or two about things which I think concern us all.

I spoke in Denver a number of years ago suggesting that graduate deans' terms of office should be about five years or six years between sabbaticals. I am now as I depart, practicing what I preach.

But I wish to echo a note that President Page suggested in his talk and say a word for the humanities before this meeting concludes. It is, of course, important that we have spent a good deal of time on such things as loan programs and graduate education costs and procedures in satisfying demands of teaching assistants. We have all of us known for 2,000 years that culture is a by-product of commerce, and we have learned to live with that fact.

But culture, as a humanist sees it, meseems, is now more and more becoming a by-product of budgetary policy or fiscal policy made not by the fraternity but by outside organizations that have the money and, therefore, direct the flow.

Now, nothing is gained from condemning the vocational turn of the NSF and HEW, and if the inundating flow of the Doctor of Arts, and the Doctor of Professional Studies is upon us and is inevitable, that's fine. Experimentation is always a good thing. But let us, for God's sake, get rid of two besetting sins of thought. One is the *myth*, now hardening into a cliché, that the Ph.D. can only teach a fragment of knowledge. That's absolute nonsense! The system of the present Ph.D. program assures a certain depth; the quality of the man or the quality of the woman assures the breadth and the imaginative scope, and not the system.

Secondly, let's get over the idea that graduate education, as it falls to our responsibility, can take and should take *all* social activity for its province.

Let's not lose sight of the goals of a liberal education. Let's remember that a great complex society such as ours moves and acts and lives because of a kind of division of labor.

I think of this particularly as I think of New York University, which is a great, sprawling institution located all over town. The Graduate School of Arts and Science is nestled among fourteen professional schools. There is a School of Social Work and it is for a fact vocational. There is a School of Law, and it's vocational, and Medicine, and Dentistry, and Public Administration. That the Graduate School of Arts and Science should drift into compelling vocationalism and technical application following a modern fad of bowing to Mammon seems to me to be somewhat of an absurdity. Fortunately all the professional schools there show concern that the university will stand *only* if it has a strong School of Liberal Arts, a strong School of Graduate Arts and Science, that it should be humanistic and not become primarily vocational.

The Ph.D. program it seems to me should be, and probably is in many places, imaginative and elastic. It should bring in new inclusions and make new emphases lest we flounder in the sea of vocationalism which is seemingly about to sweep over us.

Let us remember, gentlemen and ladies, the comment from Robert Bridges' *Testament of Beauty*, which, in this particular organization, seems to me particularly apposite; namely, that "our stability is only balance and conduct lies in masterful administration of the unforeseen." Let us, for heaven's sake, emphasize in that intriguing "unforeseen" education and not training. One can train a seal but not educate him; one can educate a teacher but not effectively train him. Up humanism, and right on!

Rees: Thank you, Dean Stone. I call to your attention the two additions to the Executive Committee this year are from the humanities. Dean Colbourn?

Colbourn, University of New Hampshire: I am not aware of the agenda for this morning's meeting, so I may be quite out of order and will accept advice to that point.

But I was much interested, of course, as I am sure many were, in your earlier remarks about the prospective *ad hoc* committee to take a look at the questions that several have raised regarding the forthcoming ACE report on graduate education.

I am not aware as to the precise charge this committee will have or whether it is going to be a committee voted upon by this body. But I can't help but wonder whether it would still not be appropriate for the Council to make known, at least some degree of sentiment, on this issue without, it seems to me, necessarily specifically condemning or criticizing without information and without study.

And in that context, I would like to suggest a motion to this body that might be something as follows:

> That the Council of Graduate Schools notes with concern the forthcoming publication of the second report on the reputation of graduate faculty. The Cartter report was widely and erroneously hailed as a definitive evaluation of graduate education and it is to be feared that the second report, confined to 36 disciplines at 180 institutions, may be subject to comparable misunderstanding.

Rees: You have heard the motion. Is there a second? *(The motion was seconded from the floor.)* Discussion?

Roaden, Ohio State University: I would like to speak in favor of the sentiment of the motion, but suggest that we defeat the motion. It is tough today to read the public sentiment and know whether to respond positively or react negatively, or to give leadership in different directions. We must realize that the public sentiment today is toward assessment and accountability for all of our programs at all levels. I am fearful that a resolution such as the one that has been presented would be interpreted as a resolution against assessment and against our being accountable for the quality of our programs.

It would seem to me that a resolution of this order ought to be defeated in favor of a sentiment that this Council is interested in being assessed and is interested in being accountable to its publics for all of its graduate education programs and that we would give leadership to subsequent studies that would extend beyond the method of using peer judgments for assessing the quality of our graduate faculty.

Spragg, University of Rochester: Madam Chairman: Although one can sympathize with the concerns expressed by the maker of the motion, I would urge that this motion be defeated on two grounds: First, that it is redundant; and second that it is pre-judging.

It is redundant in that you, Madam Chairman, have already indicated that the Council of Graduate Schools is concerned. The appointment of an *ad hoc* committee to study and make a report on this report is, I believe, a full and adequate expression at this time of the concerns of the Council.

Secondly, I am afraid that the wording of the motion as presented contains pre-judging sentiments which I think should be avoided at this stage in the study of the report.

None of us has seen the full report. We have seen only a summary of ratings of our own institutions. I think it would be inappropriate for the Council of Graduate Schools to support at this stage the editorial comment that is contained in the wording of the motion.

Rees: Dean Colbourn?

Colbourn: I just wanted to observe that I do appreciate the sentiments just conveyed and, indeed, had hoped to meet such concerns.

It does seem to me, however, that we do know as of right now certain salient points. One is that the forthcoming report addresses a fraction of the institutions in this Council. Another is that it addresses only a fraction of the disciplines that are embraced by graduate education in this Council. I don't think those are controversial questions. Nor do I think that involves editorial comments.

Further, we know that the forthcoming report, like the first, is an assessment of reputations, not of programs, and certainly does not involve even the kind of assessment, for example, undertaken very systematically by NDEA in looking at a given department in a given institution.

This, in short, is the context of my concern and what I thought might be conveyed by the Council, not in a destructive sense; indeed, I would like to observe that I had thought originally, before hearing confirmation of the establishment of the *ad hoc* committee, to offer a second comment to the effect. I will just read it for the record.

> While appreciating the motivation of the ACE report, which is confined to reputation, it does reflect the need for a systematic evaluation of the quality of graduate programs and the Council of Graduate Schools should acknowledge and address its responsibility and undertake a professionally oriented review of graduate education.

Rees: Dean Wolverton.

Wolverton, Miami University: In response, I would like to suggest that I concur with some of these sentiments, but I think they would have more impact if they were, indeed, directed to the ACE, which is the body which is responsible for the conducting of this report, and suggest, just as the speaker did, that if any more reports are to be done, this organization take the leadership in working with them.

The ACE is, I think we all recognize, perhaps "the" single most potent force or potential force we have in Washington for all higher education. I think we could recommend our sentiments to them, pointing out these limitations and suggesting that by working with us, a better report might be put out in the future.

Roth, George Washington University: I am Darlene Roth, and I was given this as a motion from Dean Arthur Burns of G.W., which possibly could be introduced as a substitute.

> The Council of Graduate Schools requests the American Council of Education to refrain from further evaluation of graduate work until such time when the American Council on Education can conduct site visits to ascertain firsthand the facts essential to an infomed and valid evaluation.

Rees: This, I think, is submitted as a substitute motion; is that right? The discussion then is on the substitute. Is that motion seconded?

(The motion was seconded from the floor.)

Elder, Harvard University: Madam Chairman, may I move to table the motion?

(The motion was seconded from the floor.)

Rees: Motion has been made to table the substitute motion, Dean Elder?

Elder: The whole business.

Rees: The motion has been made to table this whole discussion. The motion is not subject to debate. Those in favor of the motion please say Aye. Opposed, No. The motion is carried. Is there any other New Business to come before the body?

Ferrante, University of Rhode Island: I asked a question at the Plenary Session this morning which I believe should be repeated here since this is the official business meeting of the Council.

Last year the Council was asked to endorse in some way the further study of Doctor of Arts degree programs. As a matter of fact, the January 1970 Newsletter, which reported on last year's annual meeting contained the statement that the Committee on the Preparation of College Teachers was then preparing a further revised draft of the statement for submission to a mail vote of the membership.

The draft referred to is that describing the Doctor of Arts program. Since that time, in March of 1970, the Council published a pamphlet, "The Doctor of Arts Degree." That pamphlet contains a statement that the Executive Committee of the Council of Graduate Schools and the Council had, in principle, recommended the establishment of graduate programs leading to the Doctor of Arts degree.

My question is, Has the Executive Committee decided that this body should abandon the plan to solicit the vote of each member by mail concerning this program?

Dean Proctor earlier mentioned that a revision of the pamphlet describing the Doctor of Arts Degree is in preparation. Do you plan to go ahead with the revision without submitting it to this body for review and approval?

Rees: The Executive Committee has decided that the document needs revision. It has not made the decision on the specific question you have asked about.

Is there any further action that you wish this body to take in communicating with the Executive Committee?

May I interrupt? Dean Proctor seems to have something further to say.

Proctor: I think Dean Ferrante has raised a valid point, and I would like to recall to the membership one or two things.

In my opening remarks last year at the beginning of the Conference as Chairman, a tradition which has been established by Dean McCarthy, I said that I thought that one of the things the Council of Graduate Schools ought to do when it makes a policy statement that takes a definitive position upon an important question is somehow to communicate more directly and immediately with its membership. I still believe that that is a good principle. It is a principle, if carried out entirely, would revive the old New England town meeting.

There are times, however, when it isn't possible to be quite that thorough in your procedures in sounding out the opinion of the Council of Graduate Schools.

As I said earlier this morning, we were confronted with certain facts, with the rapid development of this new degree idea by institutions. We were confronted by the fact that other national organizations, such as the American Association of State Colleges and Universities, had, in my judgment, unwisely taken positions on graduate matters which should properly fall within the scope of this organization. We were confronted by the fact that the U.S. Office of Education had formerly and informally requested from the Council a statement of at least tentative guidelines which might serve them as well as the member institutions of the Council of Graduate Schools.

We were also confronted by the additional fact that one of the great foundations in the United States had become strongly interested, and interested to the point of investing money in at least experimental consideration of either a new degree, the Doctor of Arts or, as was indicated earlier this morning, perhaps some revision of the Ph.D.

At any rate, the point I am making is that the situation had become urgent and that it seemed important that the Council of Graduate Schools have some printed statement.

Now I would like to inject one other consideration; a reminder that in our Constitution, which was formally adopted by the entire Council and which has served as its guideline for its operations in these ten years, there is the provision that when the Council is not in session at its Annual Meeting, the Executive Committee can act for the Council.

Therefore, all actions that have been taken with respect to the publication of the booklet were sanctioned by the Executive Committee. The Executive Committee, I think in its wisdom, decided that although a mail vote would be important and, indeed, desirable—and perhaps this can be done in the future—nevertheless, the Council could no longer remain silent. It was, in my opening remarks a year ago, stated that it seemed to me that all too often the Council had reacted after the fact, that it had been too often confronted by a *fait accompli* and that this situation, I think, was clearly developing with respect to the development of the Doctor of Arts, or revision of the Ph.D.

For those reasons, the Committee on the Preparation of College Teachers, in close consultation and with the authorization of the Executive Committee, did prepare a tentative statement. We clearly indicate in our letter of transmittal that it is a tentative statement, that it should be revised, and that publication then came out under the aegis of the Executive Committee.

I do agree with you, sir, that it is important to have, whenever possible, the full consent of the full body. That consent is difficult to obtain except at the Annual Meeting. Sometimes affairs will not wait as, for example, the recent report of the Carnegie Commission.

So I can only reiterate that we acted in good faith, that the Council did officially a year ago endorse in principle consideration of this new development.

I think that's about the best explanation that can be offered, Madam Chairman.

Ferrante: I appreciate the urgency which motivated the Executive Committee to act for the Council and I hope my remarks were not misinterpreted. I did not question in any way either the authority or the good faith of the Executive Committee in acting as they did, and I believe the action can be justified.

However, as you just stated, the March 1970 pamphlet is a tentative statement and last year we were explicitly told that we would be requested to express our opinion on this matter by mail vote. As a matter of fact, just before the pamphlet was published, I submitted to the graduate faculty of the University of Rhode Island the draft statement for their review. We held a meeting just to discuss the statement. I told the faculty that we would have an opportunity to discuss it further and we would have an opportunity to either endorse the proposal or not. Now I think the urgency mentioned earlier is past, and since a new statement will be drafted, I don't think it would be inappropriate to ask the membership to endorse or not endorse this proposal as originally planned.

If the endorsement of the Council means anything, it would be much better to have the entire membership participate in the voting. I don't see any urgency now that should preclude our participation.

> Therefore, I move that the Executive Committee conduct a mail ballot or solicit the vote of all member universities and colleges on the question of endorsement of the statement on the Doctor of Arts Degree which has been prepared by the Special Committee on the Preparation of College Teachers.

Rees: May I ask that you phrase that—you may not want to—but let me ask if you would be prepared to make that a motion that the new drafted statement be submitted to the vote.

Ferrante: Yes, that's my intent; that the new draft statement be submitted to a vote of approval or disapproval by the entire membership. I am surprised that the Executive Committee or some other appropriate committee didn't come to this meeting with such a proposal.

Rees: Is there a second to the motion?

(The motion was seconded from the floor.)

Is there any discussion? Those in favor of the motion please say Aye. Opposed, No. The motion is carried.

Is there anything further to come before this meeting?

May I then thank the members of the Executive Committee and express our appreciation, not only to Jim Eshelman, who has already been thanked for his excellent management of the meeting, but to Al Proctor for whom this is the last meeting as a member of the Executive Committee, and particularly to Steve Spurr who succeeds me as Chairman of the Council.

I now formally turn over the gavel, which is the symbol of this office.

(Applause)

Spurr: I have one brief comment. It is quite obvious to me and to the Executive Committee that there is a great deal of legitimate concern with the ACE rating, that the charge to our committee must be to pursue its investigation with vigor, constructively, and I would like to solicit those of you who are willing to work and are interested to let me know of your interest because we must put together a competent committee. I guess we would like to know something about your professional qualifications along these lines. But I do want to assure you that all of us in the Executive Committee share the concern and agree with the need to have a constructive input into any future ratings or evaluations of graduate schools.

I would like to say it has been one of the great pleasures in my professional career to have worked with and under Dr. Rees, and I suggest that we give her a standing ovation.

(Standing applause.)

REPORT OF PROGRESS OF THE GRADCOST RESEARCH GROUP

The Gradcost Study, jointly sponsored by the Council of Graduate Schools in the United States and the National Association of College and University Business Officers, funded by the National Science Foundation, and being conducted in Seattle, Washington, is about seven months old. The research group welcomes this opportunity to report to you on the progress of the Study so far and the direction it has taken.

Under the direction of Dr. Joseph L. McCarthy, Dean of the Graduate School, and the co-direction of Mr. James F. Ryan, Vice President for Planning and Budgeting at the University of Washington, work is being carried out by Dr. Robert D. Lamson, Director of Planning Studies at the University of Washington, who is working part-time on the project; and a candidate from the Department of Economics of the University of Washington, Mr. John H. Powel, Jr., who is working full-time.

The study was designed primarily as a literature search. As such, one of its important functions is the collection and analysis of published literature. Equally important is the review of the large body of fugitive literature, such as internal memos, manuscripts, and unpublished theses which exist in and out of institutions of higher learning. Understandably, it has proven much more difficult to obtain access to the latter material. With this problem in mind, the research group prepared in late July a communication which was to serve as a dragnet letter for such unpublished sources. This dragnet letter was sent to the Graduate Deans and to the Financial Affairs Officers at over 285 institutions of higher learning, to all State Boards of Higher Education, and to various other potential contributors to the project. Along with the letter were sent a brief description of the project and a Preliminary Bibliography, to which the addressee was invited to make additions.

The response began almost immediately. For the most part, it has been supportive of the aims of Gradcost; and contributions have been widely varied in nature. As of late November, 1970, responses had been received from 35 percent of the Graduate Deans and Financial Affairs Officers, 45 percent of the State Boards of Higher Education, and 30 percent of the other organizations and individuals to whom the letters were sent. Of the first two groups, slightly under one-third responded with lists of additional references, and approximately 15 percent contributed materials to the study. From the third group over 80 percent contributed materials. The materials contributed have consisted for the most part of unpublished reports, manuscripts, and other documents valuable to the Gradcost effort. Unit cost studies, including both the methodology and resulting data for major public universities in ten states, have been received.

At this point, analysis of the literature actually read and perusal of the titles yet to be looked at indicates that the literature itself is divided roughly 70/30 between theoretical analysis and practical application. As might be expected, however, there is generally no clear progression from the former to the latter. Many theoretical problems have been raised but remain unsolved. At the same time, probably in response to the growing interest on the part of state and federal officials, actual studies have been undertaken which assume convenient proxies for educational outputs and proceed to allocate costs to them.

The breadth of the problem of resource allocation in higher education, for example, is richly documented. While the objective of maximum effectiveness for resources in higher education is widely discussed, both in theoretical journals and in the more practical oriented studies, it has yet to be defined in operational terms in any of these sources, much less implemented at any institution of higher education. Outputs of graduate education, similarly, have yet to be defined in a standardized or widely accepted manner. In fact, definitions of the benefits of graduate education seem to proliferate in inverse proportion to their degree of measurability. Needless to say, the state of the theoretical literature on the subject lends a degree of uncertainty to studies which claim to represent unit costs of graduate education.

Outputs have been identified which accrue directly and solely to the individual "clients" of that process, the student. The training and other benefits which students derive from graduate education are mostly identifiable; and it does not appear to be entirely impractical to allocate costs accordingly, on a "unit" basis by degree program.

Development of a sound analytical background for such an exercise and review of current unit cost studies and their results in such a context were identified in the Gradcost Proposal as worthwhile outcomes to be expected from the Gradcost Study. These goals place most emphasis upon the evaluation of outputs from the cost side, in average terms, and leaves for briefer consideration the problems of incremental costs and the evaluation of outputs from the benefit side. This emphasis, which defines the project more specifically, was approved at a recent meeting of the Joint Gradcost Committee and was acceptable to the representative of the funding institution, the National Science Foundation.

Specifically, the Joint Gradcost Committee has planned to produce one document which comprises the following: (1) An Analytical Report, meeting the aims outlined above. (2) A complete listing, alphabetically, of sources referred to in compiling the Analytical Report. (3) An Annotated Bibliography of sources selected for their particular relevance and potential interest to administrators and other students of the problem.

A second document is also contemplated. This will be a more complete bibliography for limited distribution, perhaps on a request basis only.

First drafts of the Analytical Report are currently being prepared and will be submitted to the Steering Committee for review when it meets in New York in February. Revisions which are developed at this meeting will be made before submission of further drafts to the Steering Committee in March or April and to the full Joint Committee in May. It is anticipated that final drafts will be approved for publication sometime in June or early July.

Sources for the Annotated Bibliography will be selected and reviewed for the duration of the project until publication requires termination of the literature search. Since November the Research Group has been working on possible frameworks for presentation of the available cost information. Because the form this presentation takes will depend ultimately on the type of data available, this will not be finalized until the beginning of February.

Plans for distribution of the document have not yet been completed, but we are looking at the following alternatives: Copies might be distributed on a complimentary basis to all those institutions which have participated in the study and made available at cost on a first come-first serve basis to all other interested parties. Alternatively, we might request subscription in advance of publication, which would ensure that all of those wanting copies could get them. These alternatives are very tentative, however, and we do not expect to have a firm proposal until the Spring meeting of the Steering Committee.

Robert D. Lamson
John H. Powel, Jr.
James F. Ryan
Joseph L. McCarthy

REPORT ON THE COMMITTEE ON NON-DEGREE AND OTHER POST-BACCALAUREATE PROGRAMS

The Committee on Non-Degree and Other Post-Baccalaureate Programs met in Washington, D.C., on May 20, 1970. Dr. Rees, Dr. Arlt, and Dr. Page visited the Committee at the beginning of its meeting to elaborate the Executive Committee's charge, which is, briefly, to deal with post-baccalaureate work outside conventional, resident, full-time pre-doctoral programs. The Committee decided to divide its subject into the following parts: (1) Special problems of professional education and non-degree courses, (2) extra-mural centers, and (3) post-doctoral appointments.

Traditionally, the graduate school has concerned itself with programs leading to liberal-arts degrees. More recently, the number of professional graduate programs has been increasing. In some universities, these are administered by the graduate school; in others, by separate professional schools of business, education, engineering, journalism, *etc.* For those graduate schools that include professional programs, some special problems are becoming more acute.

It must be recognized that the persons who seek graduate education in the professional fields are frequently different from those who seek graduate education in the traditional liberal arts. For example, many of these professional students are employed part-time and have various types of significant occupational experience. As a result, graduate offerings, as well as residence requirements, must be redesigned for many who may work part-time and who may not take full-time graduate programs. Furthermore, because of occupational mobility, there needs to be greater transferability of graduate credit from one institution to another. An evaluative process needs to be developed for considering the experience of the individual as well as his previous academic record for admission and, in many cases, quite appropriately, for equating experience with academic credit. Consideration must also be taken of developing short-term offerings, distinguished from post-doctoral research programs, for upgrading personnel. These would not normally lead to a degree and might not offer credit.

The knowledge explosion has made it amply evident that graduate education, without regard for the degree conferred, can no longer be considered terminal and that continual upgrading is necessary for all types of scientific, professional, and academic personnel. However, the relevance of traditional courses and credit for such upgrading is highly suspect. An example is in the field of computer science, in which the development of software and hardware requires constant training programs of short duration to upgrade personnel. Many of these programs involve graduate-level training but are not amenable to the usual course structure. In fact, academic credit would be of little interest to many of those seeking the upgrading. One may find many examples of this phenomenon in other areas as well as in computer science.

In veiw of these current needs, the graduate school must consider the development of short-term courses for the purpose of upgrading personnel that may not lead to degrees and may not grant credit. These courses might be implemented in many cases on a circuit-rider basis in which teams of graduate faculty travel from center to center, but higher standards will be scored if these courses can be offered in well-organized extra-mural centers.

Because the body of knowledge is always increasing and because knowledge itself is changing, there is a greater need for continuing education of the highest graduate caliber, not only to meet professional needs but to provide the knowledge required for good citizenship. A university has an obligation to help meet this need. Much of this continuing education will be on a part-time basis. Since the part-time graduate student needs university classes and resources close to his place of employment, there will be a greater demand for university extra-mural centers, especially in urban centers. This need exists at present (over 70 percent of all graduate students are part-time, with employment outside the university), and it is being met by a growing number of extra-mural centers, including consortiums, in which several universities cooperate.

Graduate Schools, therefore, face the problem of evaluating and approving these centers for graduate study. The criteria for evaluation pertain to faculty, students, programs, resources, and administration. Ideally, these criteria should be the same as those which are supposed to control intra-mural graduate study; but the extent to which any one of these criteria is to be applied to an extra-mural center will vary, since failure to meet any criterion fully may be compensated for by excellence in other respects, by proximity to the university itself, and by the possibility of completing the program on the campus.

Faculty

1. The faculty should either be part of or have the same qualifications as the graduate faculty at the home institution.
2. The faculty should be available for conferences with the students outside of class.
3. Extra-mural teaching should be included in the faculty member's regular teaching load. Or, if this is not possible, extra-mural courses should not be regularly assigned to the same faculty member.
4. Preferably there should be full-time faculty members in residence at the extra-mural center so that students may participate in, or at least benefit by an awareness of, the research or other creative activity being carried on by the faculty. Of course, if a student

completes only part of his program at the extra-mural center and the rest of it on the campus, this criterion becomes less important.

Students

1. Those admitted to extra-mural courses for graduate credit should meet the same graduate admission requirements as intra-mural students.
2. The presence in class of other students than those admitted to graduate-degree programs must be considered in extra-mural centers as well as on the campus. In each case a number of poorly qualified or poorly motivated students of this sort would obviously dilute the quality of instruction, and this must be guarded against.
3. The student should be graded according to the same grading system and same grading standards as intra-mural students.

Programs

1. Each degree program within the center should be a well-planned, integrated pattern of courses, normally comprising courses also offered on the campus; although occasionally extra-mural centers may have unique resources justifying courses not offered on the campus.
2. Programs offered at an extra-mural center should be mutually supportive with respect to faculty and courses.
3. Individual courses should be evaluated and approved in relation to the extra-mural program of which they are a part and in relation to the resources available to extra-mural students.
4. A student should be able to complete a full and integrated degree program in a reasonable length of time.
5. The number of hours of graduate credit allowable in an extra-mural center will depend on how well the program meets the criteria outlines in this statement.

Resources

1. Libraries and laboratory facilities should be comparable, within the necessary fields, to those on the campus. Of course, if the center is within easy distance of the campus, independent facilities of this sort become less important.
2. Sometimes the excellence of certain research facilities at an extra-mural center (such as Argonne of the USACGSC) may surpass those on the campus in certain fields, in which case some other criteria for evaluation may become relatively less important.

3. Resources should be evaluated in relation to the whole program and its need for support in related fields as well as to each course.

Administration

1. The programs comprised by an extra-mural center should be administered by a person with an academic background whose appointment has the approval of the Graduate Council.
2. He should be advised by a committee of faculty and students appointed by and responsible to the Graduate Council.
3. The advisory committee should be responsible for the periodic evaluation of each extra-mural program.
4. All students must be enrolled through the Registrar's Office of the University.

For an extended study of this topic, the reader is referred to "The Invisible University: Postdoctoral Education in the United States," a report of a study conducted under the auspices of the National Research Council, National Academy of Sciences, Washington, D. C., 1969.

Post-doctoral appointments may become less as federal financing decreases. It is possible that the development of post-doctorate education as we have seen it grow may lessen. Conversely, the development may continue since the worth seems to be attested by both the university and the recipient of the appointment. We feel that some central office, perhaps the Graduate School, should serve as the appointing office for an entire institution. The postdoctoral program is particularly important for the individual who shifts or enlarges his research interests. It seems true that the post-doctoral experience helps the job opportunities of the recipient.

The status of these individuals varies from institution to institution. Usually they are considered below full-time faculty members and yet a step above the candidates for the doctorate. Often they can bring to the full-time faculty ideas from the students, and it should be realized that a post-doctoral fellow may teach either formally or informally. Certainly post-doctoral fellows should have most of the status of faculty members except legislative participation.

Robert H. Bruce
Robert T. Lagemann
George G. Mallinson
Daniel O'Kane
W. P. Albrecht, Chairman

REPORT OF COMMITTEE ON FINANCIAL AID FOR GRADUATE STUDENTS

Your committee, newly formed this year, was given its charge in May 1970 and met in Washington on October 12, joined by a representative from the Committee on Graduate Assistants. Our deliberations have occurred and our report is being presented at a time when there is more flux and uncertainty in the area of financial aid for graduate students than has been the case for many years. There are deep concerns with respect to the basic philosophies which the present federal administration may follow and the nature of the implementing legislation that will emerge as well as a great deal of uncertainty as to when any legislation whatsoever will be enacted. There are serious concerns about the very continuation of specific graduate-support programs as well as the kinds of changes that may result from shifts in philosophies and priorities.

Increasing financial stringencies of universities, both public and private, have made more difficult the institutional support of graduate students. The alleged Ph.D. "glut," whether real or fantasied, is clearly having an effect on the development of federal policy and may have effects on graduate enrollments. Recent changes in Selective Service regulations are playing a role in shaping the decisions of young people and may affect graduate student enrollments, as will the sheer numbers reaching the appropriate age groups in the immediate future. For all these reasons, your committee feels that in December 1970 its account must of necessity be an interim report rather than a definite account.

We have completed a decade which may well be called the golden decade of American graduate education. The 1960's saw a tremendous growth in graduate enrollments, in financial support, and in number of doctorates awarded. In contrast it looks as though the early years of the 1970's will be years of difficulties and challenges, with diminishing support, probable changes in the patterns of financing graduate education, and, for the near future, a leveling off and perhaps an actual decrease in graduate enrollments.

In 1960 there were 9700 doctorates awarded by United States universities; in 1969, 25,700. This growth was possible in large part because of a tremendous increase in financial support available to graduate students, largely from federal sources. During this decade the number of graduate students receiving federal fellowships and traineeships increased from 8000 to well over 50,000, and the funds available for such support rose from approximately thirty million to over one-quarter billion dollars. Stated somewhat differently, in 1960 approximately 6 percent of all enrolled full-time graduate students received federal fellowships or traineeships. This proportion reached a peak in 1967 at 17 percent. The downward trend then set in, and by 1969 this figure had dropped to 12 percent. Current budgets and projections indicate further sharp drops in federal fellowship and traineeship support, which may well result soon in an actual decrease in graduate enrollments. At the same time studies of society's needs for persons trained to the doctoral level are projecting an annual production of 50,000 to 70,000 doctorates by 1980.

If cutbacks in federal support prove to be as severe as seems likely at this time, annual doctorate production three or four years from now could be reduced to the rate of 1962 or 1963, *i.e.* about half the 1969 level. Obviously, this would vary by type of institution and by field. If this should happen, it would produce a severe discontinuity in the growth rate and, later, even a frantic acceleration in output would probably fail to meet society's needs in the latter years of the decade. We must be concerned then not so much with a possible oversupply of doctorates at the moment, but rather with maintaining support levels so that we can not only meet present needs but can achieve the output which conservative estimates indicate will be needed by 1980.

The Council of Graduate Schools and its member institutions must continue vigorously to make the case that graduate education is an important national resource, that the beneficiary is not simply the individual but also the nation. Our society depends upon a flow of highly trained and educated young people to man its schools, its colleges and universities, its research and technological laboratories, and a wide range of important positions in government and in business and industry. Since these needs are continuing and expanding, support should not and must not be turned on and off abruptly like water from a spigot. One can concede that the growth rate in graduate-student support during the 1960's could not be maintained. Yet we must agree with Dale Wolfle's comment in *Science* that "what cannot be justified is the speed with which some of the cuts are being made," and his urging that universities and the federal government should attempt to avoid such difficulties in the future by planning support on a longer time scale and with more careful account of trends in requirements and supply.

Your committee views with deep concern some of the proposals dealing with the financing of graduate education in the versions of the Higher Education Act of 1970 which have been offered so far. The proposed shift in policy away from programs which stressed direct support through fellowships and traineeships to a predominant emphasis upon loans (subsidized only if the student meets certain criteria of family need) seems to us to be a serious retrograde step.

Many students and/or their families are significantly burdened with educational debts at the time of completion of the baccalaureate degree. The kind of loan programs which have been proposed could mean a debt of fifteen thousand dollars or more at the time of the doctorate. This would obviously be an extremely heavy burden on a young person for many years and would probably be unacceptable to many. Except for certain professional fields, most notably medicine, the differential in future income between the baccalaureate degree and the doctoral degree is not sufficiently great to warrant assuming such a long term and expensive debt, and the foregoing of a reasonable income during four to six years of graduate study makes the proposition even less attractive.

In addition, such a policy would probably have undesirable self-selection features. We believe that, in general, young people from lower socio-economic groups will be more suspicious about incurring such debts, even if partially subsidized, and hence will tend to be under-represented in graduate student populations. Thus the effect might be to restrict rather than expand opportunities for disadvantaged persons. And further, a loan policy may have an effect on choice of fields; students may be more willing to assume a debt in working to the doctoral degree in applied mathematics, engineering, or similar areas than, say, in French literature or philosophy.

In some instances, loans may perform a useful function as a supplement to direct support; but we urge strongly that loans should not *replace* fellowships, traineeships, and other forms of direct support. In those instances in which a combination of direct support plus a loan seems appropriate, we would urge that the loan involvement should not exceed an amount equal to one year of support.

Federal fellowship and traineeship programs should be continued, not blindly on an open-ended basis, but in order to fulfill the nation's estimated needs for highly skilled manpower in the middle and late 1970's and into the 1980's. In view of the differing projections of the number of doctorates which will be needed annually by 1980, depending on the assumptions with which one starts, there is a great need for firmer projection figures which will command respect when the case for size of fellowship and traineeship programs is being made. We urge the Council of Graduate Schools to become even more actively engaged in encouraging and participating in such projection studies as a solid basis for recommendations for support programs.

As for levels of support, the most common yardstick has been the size of stipends paid in the larger federal fellowship and traineeship programs. However, these stipend levels were set almost ten years ago and are no longer adequate either in terms of the stipend level itself or of the cost of education allowance. Tuition and fee charges at a number of private universities are already in excess of the $2500 per year educational allowance, and studies at several state universities show an educational cost per student which is well in excess of this amount. As an attempt to correct this condition, at least in part, we endorse the recommendations of the 1968 FICE report (Federal Interagency Committee on Education) calling for a stipend level of $3000—which should be instituted immediately rather than by 1972—and an institutional allowance of $3500 per student.

Such a level of fellowship support, although in our opinion it does not go far enough to meet the needs of 1970, would be a sorely needed improvement over the levels in existing programs and over many institutional fellowship levels. Every effort should be made to maintain stipend levels for fellowships and traineeships, both from government agencies and from institutional sources, at least at a "poverty" level.

In the face of stringent budgets experienced both by federal agencies and by universities, we hold that it is important to maintain adequate stipend levels for fellows and trainees, even if this should mean a reduction in numbers. At the same time, we urge that institutions put even more effort and skill into improving the selection of fellows and other recipients of direct aid than perhaps was the case in easier, more affluent years. Better support of a smaller, more highly selected group might result in a greater contribution to society in the long run than spreading small stipends over a larger number of persons.

Your committee urges that patterns of support should, insofar as possible, be full support awards rather than partial awards ("full" in the sense of being comparable to the stipends awarded in major federal fellowship and traineeship programs). Full support should enable students to finish their doctoral programs in a shorter period of time than if only partial support is given, thus committing space and facilities within the institution for a shorter period of time and at the same time should reduce the frustrations of the student who on partial support may be obliged to supplement his income from other and possibly distracting sources.

Given satisfactory performance and progress toward the degree, we urge that support be committed for extended periods of time. Assurance might be for a continuing fellowship or, an alternative which we view more favorably, a combination of fellowship and teaching or research assistantship. Such a support combination should have a definite termination date, and we recommend a maximum of four years. It should also provide that the final year be unencumbered with service obligations so that full attention can be given to the completion of the dissertation.

In the event that financial exigencies of the institution demand a combination of direct aid and loans (an alternative which we regard as clearly less favorable), we urge that the period financed by the loan be the final year, and that this arrangement be announced and understood well in advance. Willingness to undertake a loan obligation will, we believe, be greater near the end of graduate study, when the prospects of income from a professional position are close at hand, than would be the case if a loan were taken early in the graduate career. In any event, we repeat our position that a student should not be asked to finance more than one year of his graduate study through loans.

Your committee also gave attention to the question of aid to part-time students. As is well known, most institutions limit financial aid, either in the form of direct stipends or of full or partial tuition scholarships, to students who are pursuing a full-time program of studies toward their degree.

In the face of increasing financial stringencies, some institutions may wish to examine carefully the alternative of encouraging an increased amount of part-time work toward the degree. Such encouragement might enable students holding jobs during the daytime to take late afternoon or evening courses, made available through a rearrangement of a department's course and seminar scheduling.

Further encouragement might be given by awarding partial or full tuition scholarships to the most promising and deserving part-time students. Such an award would obviously be more attractive in the case of private institutions with high tuition charges than for many state universities with relatively modest tuition and fee charges. However, the implications of encouraging more part-time work for the doctoral degree are many, and serious consideration of this alternative should be given only if other and more desirable options are not satisfactorily attainable.

Because of the relatively limited amount of time to consider the many topics assigned to it and because of present uncertainties in the financial support picture, your committee has not been able to give full attention to the charge that we should develop statements of required future financial aid with special reference to the major public and private support programs. If the Executive Committee feels that the work of this committee should continue, this is obviously an area which should be intensively studied.

There are still other areas which we have not yet fully considered but which should be developed in cooperation with other CGS committees having interests that overlap with ours.

Sam Aronoff
Robert H. Baker
Francis Boddy
Max Goodrich
S. D. Shirley Spragg, Chairman

REPORT OF THE COMMITTEE ON GRADUATE ASSISTANTS

The question was raised as to what the format should be for the report from the Committee to the Graduate Council. It was agreed that the Committee is not ready to set any kind of policy and before doing so will need to give more attention to working out what is actually going on in the area of interest assigned to it. It was noted, for example, that smaller departments have more direct administrative arrangements for working with problems of graduate assistants, while larger departments have more indirect administrative methods. There was a feeling that the work of the Committee has a great deal to do with the matter of governance, and more is needed to give a suitable format for properly recording the rights and responsibilities of graduate teaching assistants. Dean Muelder circulated copies of a report that had been worked up at Michigan State. The importance of governance was raised in respect to financial aid, for example, in that the form of governance controls the type of aid that can be granted and how it can be done. Another suggested right, insofar as members of the faculty is concerned, is to adopt governance arrangements that deal with faculty in a way that suits them. It was agreed the most we can do is highlight the problems, but what happens in a particular case is dependent on the local situation. We can work out a statement, but it could not be expected to fit all schools. We need to work out something in general that will call for proper representation of students in government. In respect to student grievances, Dean Alpert noted the need for a committee outside the regular administrative channels.

Dean Muelder noted that he had replies from only 171 of the 325 graduate universities surveyed. It was agreed that he should write to the schools who had not replied in an attempt to get more information from them.

Dean Spragg spoke briefly of the work of his committee and the report that is being submitted to the Executive Council. Dean Muelder outlined briefly the format of the program for the afternoon workshop. The question was raised as to whether this committee has responsibility for post-doctorals.

Daniel Alpert
Carl D. Riggs
Irwin W. Sizer
Sam C. Webb
Milton F. Muelder, Chairman

STATEMENT OF INCOME AND EXPENSE
FOR THE YEAR ENDED DECEMBER 31, 1970

(Prepared by Wayne Kendrick & Company, Certified Public Accountants)

INCOME		
Dues		
1970	$114,800.00	
1971	10,800.00	$125,600.00
Interest		8,377.44
Sales of Publications		3,826.54
Administrative Fees from Consultations		4,650.00
Grants		
The Danforth Foundation	$ 7,500.00	
National Science Foundation	34,800.00	
Carnegie Corp. of New York	13,700.00	56,000.00
Sale of Used Furnishings and Equipment		60.02
Miscellaneous		.18
TOTAL INCOME		$198,514.18
Deduct:		
EXPENSES		
Salaries (Not Allocable to Grants)	$ 60,140.33	
Employees' Benefits	7,297.14	
Payroll Taxes	1,451.58	
Rent	8,931.96	
Storage	256.00	
Telephone	1,496.85	
Office Supplies and Expenses	1,751.58	
Postage and Mailing	1,376.29	
Printing and Duplicating	1,467.24	
Dues	437.50	
Accounting	900.00	
Insurance and Bonding	382.00	
Subscriptions and Publications	297.12	
Printing of Publications	3,628.12	
Personal Property Taxes	70.56	

Travel and Meetings				
Staff		$ 2,322.15		
Annual Meeting				
Total Expenses	$10,883.52			
Less: Income	5,484.00	5,399.52		
Summer Workshops		14,251.60		
Other		11,026.27	32,999.54	
Furniture, Equipment, and Office Improvements			4,609.08	
Moving Expenses of New President			1,160.68	
Miscellaneous			498.52	
Expenditures from Grants (Including Salaries)				
National Endowment for the Humanities		$ 263.54		
The Danforth Foundation		24,251.89		
National Science Foundation		29,400.00		
Carnegie Corp. of New York		4,451.04	58,366.47	
TOTAL EXPENSES				187,518.56
EXCESS OF INCOME OVER EXPENSES				$ 10,995.62
Add:				
Increase in Unremitted Payroll Tax Deductions				
December 31, 1970			$ 2,937.40	
December 31, 1969			2,078.29	859.11
				$ 11,854.73
Deduct:				
Increase in Unreimbursed Consultations and Expenses				
December 31, 1970			$ 7,722.65	
December 31, 1969			6,844.41	878.24
Net Increase in Cash and United States Treasury Bills				$ 10,976.49
Cash Balance January 1, 1970 – Per Prior Audit Report				163,337.65
BALANCE DECEMBER 31, 1970 (Cash and United States Treasury Bills)				$174,314.14

ACCOUNTED FOR AS FOLLOWS:

Cash			
On Deposit – The Riggs National Bank of Washington, D.C.			
Checking Account	$ 4,143.13		
Savings Account	2,419.11		
Time Deposit, Due 6/25/71	100,000.00	$106,562.24	
Petty Cash		50.00	
		$106.612.24	
$70,000.00 United States Treasury Bills, Due 3/18/71 – At Cost		67,701.90	$174,314.14

NOTE: This exhibit reflects the cash receipts and disbursements method of accounting.

OFFICERS AND COMMITTEES

For the year following the December 1970 meeting

Executive Committee

Stephen H. Spurr (Chairman)
University of Michigan
Mina Rees (Past Chairman)
City University of New York
David R. Deener (Chairman-Elect)
Tulane University
J. Boyd Page
President, CGS, *ex officio*
Jacob E. Cobb (1972)
Indiana State University
Edwin G. Eigel, Jr. (1971)
Saint Louis University
Elizabeth R. Foster (1973)
Bryn Mawr College
Carroll L. Miller (1971)
Howard University
Philip M. Rice (1972)
Claremont University Center
Robert E. Wolverton (1973)
Miami University

Membership Committee

C. B. Hunt, Chairman (1971)
George Peabody College
Robert M. Bock (1972)
University of Wisconsin
Raymond O. Rockwood (1973)
Colgate University

Committee on Policies, Plans, and Resolutions

Michael J. Pelczar, Chairman
(1973) University of Maryland
Michael J. Brennan (1972)
Brown University
William J. Burke (1971)
Arizona State University
Elizabeth R. Foster (1972)
Bryn Mawr College
Robert F. Kruh (1973)
Kansas State University
George P. Springer (1973)
University of New Mexico
Robert B. Toulouse (1972)
North Texas State University
Cratis Williams (1971)
Appalachian State University

Committee on University-Federal Relations

D. C. Spriestersbach, Chairman
(1973) University of Iowa
Winston W. Benson (1971)
Mankato State College
Charles G. Mayo (1972)
University of Southern California
Quentin L. Quade (1972)
Marquette University
Hilton A. Smith (1973)
University of Tennessee System
Robert E. Wolverton (1971)
Miami University

Joint Committee on Accreditation and Evaluation of Graduate Work

(CGS Members)

Bryce Crawford, Chairman (1972)
University of Minnesota

F. Bohnenblust (1973)
California Institute of Technology
J. Boyd Page
Council of Graduate Schools

Committee on Post-Baccalaureate and Other Non-Degree Programs

W. P. Albrecht, Chairman (1972)
University of Kansas
Robert H. Bruce (1971)
University of Wyoming
Robert T. Lagemann (1971)
Vanderbilt University
George G. Mallinson (1972)
Western Michigan University
Daniel O'Kane (1973)
University of Pennsylvania

Graduate Record Examinations Board
(CGS Members)

Wayne C. Hall (1971)
National Academy of Sciences
Michael J. Pelczar (1974)
University of Maryland
Mina Rees (1972)
The City University of New York
Allen F. Strehler (1973)
Carnegie-Mellon University

Committee on Graduate Assistants

Milton E. Muelder, Chairman (1972) Michigan State University
Daniel Alpert (1973)
University of Illinois
Carl D. Riggs (1971)
University of Oklahoma
Irwin W. Sizer (1972)
Massachusetts Institute of Technology

Sam C. Webb (1973)
Georgia Institute of Technology

AFGRAD *Executive Deans Committee*

Gustave O. Arlt, Chairman
Council of Graduate Schools
Robert H. Baker
Northwestern University
Carroll L. Miller
Howard University
Herbert D. Rhodes
University of Arizona
Philip M. Rice
Claremont University Center
Lorene L. Rogers
University of Texas
S. D. Shirley Spragg
University of Rochester
Robert D. Stout
Lehigh University

Advisory Committee to the Institute of International Education

J. Boyd Page, Chairman
Council of Graduate Schools
Francis Boddy (1973)
University of Minnesota
Sanborn C. Brown (1972)
Massachusetts Institute of Technology
George H. Huganir (1972)
Temple University
Allen G. Marr (1973)
University of California, Davis
S. D. Shirley Spragg (1971)
University of Rochester
George P. Springer (1971)
University of New Mexico

Committee on Evaluation and Grading

David S. Sparks, Chairman (1972)
University of Maryland

Wesley J. Dale (1971)
University of Missouri at Kansas City
Andrew J. Hein (1973)
University of Minnesota

Committee on Preparation of College Teachers

Alvin H. Proctor, Chairman (1973)
Kansas State College of Pittsburg
Eugene Arden (1973)
Long Island University
Jacob E. Cobb (1973)
Indiana State University
James F. Hornig (1972)
Dartmouth College
Robert H. Koenker (1971)
Ball State University
Charles T. Lester (1972)
Emory University
Philip M. Rice (1972)
Claremont University Center
Stephen H. Spurr (1971)
University of Michigan
Morgan D. Thomas (1971)
University of Washington

Committee on Financial Aid for Graduate Students

S. D. Shirley Spragg, Chairman (1972) University of Rochester
Sam Aronoff (1971)
Boston College
Robert H. Baker (1971)
Northwestern University
Francis Boddy (1972)
University of Minnesota
Max Goodrich (1973)
Louisiana State University

Committee on Disadvantaged Students

Edwin L. Lively, Chairman (1973)
University of Akron

I. Wesley Elliott (1972)
Fisk University
Ralph Lewis (1973)
University of Michigan
H. W. Magoun (1971)
University of California at Los Angeles
Merrell E. Thompson (1971)
New Mexico State University
Oscar Zeichner (1972)
City College of the City University of New York

Committee on Instruction

Robert E. Wolverton, Chairman (1972) Miami University
Arthur H. DeRosier, Jr. (1971)
East Tennessee State University
Henry Torrey (1973)
Rutgers University

Committee on Research

Dale C. Ray, Chairman (1973)
Georgia Institute of Technology
John A. Dillon (1972)
University of Louisville
John W. McGrath (1971)
Kent State University

Committee on Graduate School Public Relations

C. Lawson Crowe, Chairman (1972)
University of Colorado
Richard K. Barksdale (1971)
Atlanta University
George H. Huganir (1973)
Temple University

Committee on Graduate School Governance and Administration

John K. Major, Chairman (1972)
University of Cincinnati
Frederick N. Andrews (1973)
Purdue University

J. N. Gerber (1971)
Stephen F. Austin State University

Committee on Graduate Student Relations

Harrison Shull, Chairman (1972)
Indiana University
Philip E. Kubzansky (1971)
Boston University
Otis H. Shao (1973)
University of the Pacific

Committee on Costs of Graduate Education

David R. Deener, Chairman
Tulane University
Kenneth D. Creighton
Stanford University
Paul V. Cusick
Massachusetts Institute of Technology
D. F. Finn
National Association of College and University Business Officers
Loren Furtado
University of California
Wayne Hall
National Academy of Sciences
Thomas D. Jarrett
Atlanta University
Franklin P. Kilpatrick
University of Delaware
Ben Lawrence
Western Interstate Commission for Higher Education
Gilbert L. Lee, Jr.
University of Chicago
Joseph L. McCarthy
University of Washington
J. Boyd Page
Council of Graduate Schools
James F. Ryan
University of Washington
Allan Tucker
State University System of Florida
Robert H. Wessel
University of Cincinnati

THE CONSTITUTION OF THE COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES

1. *Name*

This organization shall be called the Council of Graduate Schools in the United States.

2. *Purpose*

The Council is established to provide graduate schools in the United States with a comprehensive and widely representative body through which to counsel and act together.

Its purpose is the improvement and advancement of graduate education. The purview of the Council includes all matters germane to this purpose. The Council shall act to examine needs, ascertain best practices and procedures, and render assistance as indicated; it may initiate research for the furthering of the purpose. It shall provide a forum for the consideration of problems and their solutions, and in meetings, conferences, and publications shall define needs and seek means of satisfying them in the best interests of graduate education throughout the country. In this function the Council may act in accordance with the needs of the times and particular stiuations to disseminate to the public, to institutions, to foundations, to the federal, state, and local governments, and other groups whose interest or support is deemed of concern, information relating to the needs of graduate education and the best manner of satisfying them.

In the analysis of graduate education, in the indication of desirable revision and further development, in the representation of needs and all other functions related to effecting its purpose, the Council not only shall be free to act as an initiating body, but it shall assume direct obligation for so doing.

3. *Membership*

Institutions applying for membership shall be considered in the light of the following criteria:

a. Applicants for membership must be accredited by the appropriate regional accrediting agency as a college or university approved for the offering of graduate work.

b. Applicants must have conferred at least thirty degrees of Master of Arts or Master of Science or ten Doctor of Philosophy degrees, or appropriate combination, within the three-year period preceding application.

c. The degrees conferred must be adequately distributed over at least three distinct disciplines, such as but not limited to:

agriculture
anthropology
astronomy
bacteriology
biochemistry
botany
chemical engineering
chemistry
civil engineering
classics
economics
electrical engineering
English
entomology
fine arts
French
geography
geology
German
history
mathematics
mechanical engineering
music
pharmacology
philosophy
physics
physiology
political science
psychology
Russian
sociology
Spanish
zoology

The Committee on Membership shall consider all applications in the light of these criteria and make appropriate recommendations to the Executive Committee. The Executive Committee shall take final action on all applications for membership and shall report such action at each Annual Meeting.

The Executive Committee may invite and approve applications by foreign institutions of good standing for affiliation with the Council if such institutions meet all criteria for membership except accreditation by an American regional accrediting agency. Such affiliates will be extended all the courtesies of membership except the privilege of voting.

4. *Voting Power*

In all activities of the Council, each member institution shall have one vote.

More than one representative of any institution may attend the meeting of the Council, but the member's vote shall be cast by the individual designated as the principal representative of the member by the chief administrative officer of the member institution.

5. *Officers and Executive Committee*

The officers of the Council and the Executive Committee shall be a Chairman, a Chairman-Elect, and the immediate Past Chairman, each serving for a term of one year. In the absence of the Chairman, the Chairman-Elect shall be the presiding officer of the Executive Committee and the Council.

There shall be an Executive Committee of nine voting members, composed of the Chairman, the Chairman-Elect, the Past Chairman, and six members-at-large. Two members-at-large shall be elected by the Council at each Annual Meeting for terms of three years each, beginning immediately after the Annual Meeting.

The Chairman-Elect, chosen by the Executive Committee from its own past or present membership, shall serve in that capacity for one year. The following year, he will assume the office of Chairman, and the following year, the office of Past Chairman.

The Executive Committee, acting as a nominating committee, shall propose a nominee for each position at large to be filled. Other nominees may be proposed from the floor. The nominee receiving the largest number of votes for an unfilled position shall be declared elected.

Each voting member of the Executive Committee must be the principal representative of a member of the Council, and none may serve for two consecutive full terms.

If the Chairman is unable to continue in office, the Chairman-Elect shall succeed immediately to the chairmanship, and the Executive Committee shall choose a new Chairman-Elect.

Any vacancies occurring among the membership-at-large of the Executive Committee shall be filled by the Executive Committee until the next Annual Meeting, at which time the Council shall elect a replacement for the balance of the term.

6. *Executive Officers*

The chief executive officer of the Council shall be a President, who shall be a salaried officer, appointed by the Executive Committee and serving at its pleasure. The President shall serve as an *ex-officio* member of the Executive Committee without a vote.

7. *Duties and Powers of the Executive Committee*

In addition to the duties and powers vested in the Executive Committee elsewhere in this Constitution, the Executive Committee may, specifically: employ such staff and establish such offices as may seem necessary; incorporate; undertake itself, or through its agents, to raise funds for the Council and to accept and expend monies for the Council; take initiative and act for the Council in all matters including matters of policy and public statement except where limited by this Constitution or by actions of the Council.

8. *Committees*

In addition to the Executive Committee, there shall be a Committee on Membership, whose members shall not be members of the Executive Committee. This committee shall be appointed by the Chairman with the advice and consent of the Executive Committee.

Other standing committees may be established by the Executive Committee.

Both standing and *ad hoc* committees shall be appointed by the Chairman with the advice and consent of the Executive Committee.

9. *Meetings*

The Council shall hold an Annual Meeting at a time and place determined by the Executive Committee. The Council may meet at other times on call of the Executive Committee.

The Executive Committee shall be responsible for the agenda for meetings of the Council. Reports and proposals to be submitted for action by the Council shall be filed with the Executive Committee before they may be submitted for general discussion by the Council. No legitimate report or proposal may be blocked from presentation to the Council, but action on any proposal may not be taken until the Executive Committee has had an opportunity to make a recommendation.

In matters not provided for in this Constitution, parliamentary procedure shall be governed by *Robert's Rules of Order, Revised.*

10. *Limitation of Powers*

No act of the Council shall be held to control the policy or line of action of any member institution.

11. *Dues*

Membership dues shall be proposed by the Executive Committee and must be approved by the majority of the membership after due notice.

12. *Amendments*

Amendments to this Constitution may be proposed by the Executive Committee or by written petition of one-third of the members. However they originate, proposals for amendment shall be received by the Executive Committee and forwarded with recommendations to the members, in writing, at least ninety days before the meeting at which they are to be voted upon. To be adopted, proposed amendments must receive the approval of a two-thirds majority of the members voting at the announced meeting.

13. *Bylaws*

Bylaws may be established by the Executive Committee at any regular or special meeting, subject to ratification by a simple majority vote of the Council at the next Annual Meeting.

BYLAWS

1. In conformity with Article 6 of the Constitution, the President of the Council of Graduate Schools in the United States shall be paid an annual salary to be determined by the Executive Committee plus such perquisites as may be necessary for the proper conduct of the office and such travel as may be deemed essential. The President is authorized to employ such additional personnel as is, in his judgment, necessary for the proper conduct of the office, to establish bank accounts in the name of the Council of Graduate Schools in the United States, and to draw checks and invest monies against the Council's account or accounts, subject to an annual audit of the books of the Council by a Certified Public Accountant and approval by the Executive Committee.
2. The Riggs National Bank of Washington, D. C., is hereby designated a depositary for the funds of this association and the said bank is hereby authorized and directed to pay checks and other orders for the payment of money drawn in the name of this association when signed by the President and the said bank shall not be required, in any case, to make inquiry respecting the applications of any instrument executed in virtue of this resolution, or of the proceeds therefrom, nor be under any obligation to see to the application of such instrument of proceeds.
3. In the event of the dissolution of the Council of Graduate Schools, all then existing assets of the Council shall be distributed in equal parts to the institutions which will at that time be members of the Council.

4. After January 1, 1969, the fiscal year of the Council of Graduate Schools in the United States will correspond to the calendar year. (Prior to this date, the fiscal year ran from April 1 through March 31.)
5. In the event of the death or disability of the President of the Council, the Chairman shall immediately call a meeting of the Executive Committee to select an Acting President, who shall assume the responsibilities of the President, as they are specified in Article 6 of the Constitution and in Bylaws 1 and 2, until the appointment of a new President.

PROCEDURAL POLICIES

1. Annual meetings of the Council shall be held during or near the first week of December.
2. If a member resigns, it must re-apply for admission in the normal way if it wishes to resume membership.
3. Membership or affiliation, with or without vote, of non-academic institutions, associations, or foundations is undesirable.
4. Institutions accepted to membership prior to September 1 in any given year are required to pay dues for that fiscal year.
5. The Annual Meeting of the Council shall be held in Washington, D. C. in each odd-numbered year.

THE COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES

MEMBER INSTITUTIONS

Abilene Christian College
Adelphi University
Air Force Institute of Technology
Alfred University
*American University
Andrews University
Appalachian State University
Arizona State University
Atlanta University
Auburn University
Ball State University
Baylor College of Medicine
Baylor University
*Boston College
Boston University
Bowling Green State University
Bradley University
*Brandeis University
Brigham Young University
Brooklyn College of the City University of New York
*Brown University
*Bryn Mawr College
Bucknell University
*California Institute of Technology
California State College at Fullerton
California State College at Hayward
California State College at Long Beach
California State College at Los Angeles
Canisius College
*Carnegie-Mellon University
*Case Western Reserve University
*Catholic University of America
Central Michigan University
Central Missouri State College
Chicago State College
Chico State College
The City College of the City University of New York
The City University of New York
*Claremont University Center
*Clark University
Clarkson College of Technology
Clemson University
Colgate University
College of the Holy Names
College of Saint Rose
College of William and Mary
Colorado School of Mines
Colorado State University
*Columbia University
Connecticut College
*Cornell University
Creighton University
Dartmouth College
De Paul University
Drake University
Drexel University
*Duke University
Duquesne University
East Carolina University
East Tennessee State University
East Texas State University
Eastern Michigan University
*Emory University
Fisk University
Florida Atlantic University
*Florida State University
*Fordham University
Fort Hays Kansas State College
Fresno State College

George Peabody College
*George Washington University
*Georgetown University
Georgia Institute of Technology
Georgia State University
*Harvard University
Hofstra University
Howard University
Hunter College of the City University of New York
Idaho State University
*Illinois Institute of Technology
Illinois State University
Immaculate Heart College
Indiana State University
*Indiana University
Indiana University of Pennsylvania
*Iowa State University
John Carroll University
*Johns Hopkins University
Kansas State College of Pittsburg
Kansas State Teachers College
*Kansas State University
Kent State University
Lamar State College of Technology
*Lehigh University
Loma Linda University
Long Island University
*Louisiana State University
Louisiana State University in New Orleans
Louisiana Tech University
Lowell Technological Institute
*Loyola University
Loyola University of Los Angeles
Mankato State College
Marquette University
*Massachusetts Institute of Technology
Medical College of Georgia
Medical College of Virginia
Memphis State University
Miami University
*Michigan State University
Michigan Technological University
Middle Tennessee State University
Mississippi College
Mississippi State University
Montana State University
Montclair State College
Morgan State College
Murray State University
Naval Postgraduate School
New Mexico Institute of Mining and Technology
New Mexico State University
*New School for Social Research
*New York University
Newark College of Engineering
Niagara University
North Carolina Central University
*North Carolina State University at Raleigh
North Dakota State University
North Texas State University
Northeast Louisians State College
Northeastern Illinois State College
Northeastern University
Northern Illinois University
Northwestern State University
*Northwestern University
Oakland University
*Ohio State University
Ohio University
*Oklahoma State University
Old Dominion University
*Oregon State University
Pacific Union College
*Pennsylvania State University
Pepperdine College
*Polytechnic Institute of Brooklyn
Pratt Institute
*Princeton University
*Purdue University
Queens College of the City University of New York
*Rensselaer Polytechnic Institute
*Rice University
*Rockefeller University
Roosevelt University
*Rutgers, The State University
Sacramento State College
*Saint John's University
*Saint Louis University

Saint Mary's University
Sam Houston State College
Samford University
San Diego State College
San Fernando Valley State College
San Francisco State College
San Jose State College
Seattle University
Seton Hall University
South Dakota State University
Southern Illinois University
Southern Methodist University
Southwest Texas State University
*Stanford University
State University of New York at Albany
State University of New York at Binghamton
*State University of New York at Buffalo
State University of New York—Downstate Medical Center
State University of New York at Stony Brook
Stephen F. Austin State University
Stetson University
Stevens Institute of Technology
*Syracuse University
*Temple University
Tennessee Technological University
*Texas A&M University
Texas Christian University
Texas Southern University
Texas Tech University
Texas Woman's University
Thomas Jefferson University
Trinity University
*Tufts University
*Tulane University
Tuskegee Institute
United States International University
Utah State University
*Vanderbilt University
Villanova University
*Virginia Polytechnic Institute
Wagner College
*Washington State University
*Washington University
*Wayne State University
Wesleyan University
West Texas State University
*West Virginia University
Western Illinois University
Western Michigan University
Western State College of Colorado
Western Washington State College
Wichita State University
Winthrop College
Worcester Polytechnic Institute
Xavier University
*Yale University
Yeshiva University
University of Akron
*University of Alabama
University of Alabama in Huntsville
*University of Arizona
University of Arkansas
*University of California at Berkeley
University of California at Davis
University of California at Irvine
*University of California at Los Angeles
University of California at Riverside
University of California at San Diego
University of California at Santa Barbara
*University of Chicago
*University of Cincinnati
*University of Colorado
*University of Connecticut
University of Dayton
*University of Delaware
*University of Denver
University of Detroit
*University of Florida
University of Georgia
University of Hawaii
University of Houston
University of Idaho

*University of Illinois
*University of Iowa
*University of Kansas
*University of Kentucky
University of Louisville
University of Maine
*University of Maryland
*University of Massachusetts
University of Miami
*University of Michigan
*University of Minnesota
University of Mississippi
*University of Missouri at Columbia
University of Missouri at Kansas City
University of Missouri at Rolla
University of Montana
*University of Nebraska
University of Nebraska at Omaha
University of Nevada
University of New Hampshire
*University of New Mexico
*University of North Carolina at Chapel Hill
University of North Carolina at Greensboro
*University of North Dakota
University of Northern Colorado
University of Northern Iowa
*University of Notre Dame
*University of Oklahoma
*University of Oregon
University of the Pacific
*University of Pennsylvania
*University of Pittsburgh
University of Rhode Island
University of Richmond
*University of Rochester
University of San Francisco
University of Santa Clara
University of Scranton
University of South Carolina
University of South Dakota
University of South Florida
*University of Southern California
University of Southern Mississippi
University of Tennessee Medical Units
*University of Tennessee System
*University of Texas
University of Toledo
University of Tulsa
*University of Utah
University of Vermont
*University of Virginia
*University of Washington
*University of Wisconsin
University of Wisconsin-Milwaukee
*University of Wyoming

*Founding institutions